The Role of Value Similarity in Close Relationships

Litzellachner, Lukas

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The Role of Value Similarity in Close Relationships

Lukas Franz Litzellachner

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Supervisory Team:

Prof Gregory R. Maio

Prof Bas Verplanken

Department of Psychology

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Table of Contents

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Thesis Abstract

This thesis examines psychological antecedents and consequences of actual and perceived similarity between romantic relationship partners' human values. Regarding effects of actual value similarity, previous research reached different conclusions using problematic means of analysis (i.e., difference scores and profile correlations) and diverse methods and samples. To address this problem, I conducted research using polynomial regression and response surface analysis as improved means of analysing effects of actual value similarity, and measure a broader range of values (by additionally recoding values-as-traits and traits-as-values), in two samples of relationship partners (*N*s = 174 and 149 couples). My findings show that actual similarity can be beneficial for relationship quality when observed in some values, but not in others. Specifically, I find a positive effect of similarity in conscientiousness values, but also a replicable complementarity effect in benevolence values (but only when measured as traits). Regarding effects of perceived similarity, I present a novel theoretical framework to explain why perceptions of similarity in some individual differences dimensions to have more influence on relationship quality than others. This framework predicts an effect of perceived similarity in personality dimensions like values, relationship ideals, and traits to be important for relationship quality if they are informative about common goals, and if this information makes perceiving partner support plausible. Consistent with this framework, goal-informative dimensions (i.e., values and relationship ideals) were more closely linked to relationship quality than less goal-informative dimensions (i.e., traits). Furthermore, perceived goal similarity and perceived partner goal support mediated the effect of perceived value and relationship ideal similarity on relationship quality. In sum, my findings show that, while the presence and direction of the effect actual partner value congruence differs between dimensions, the effect of perceived similarity is universally positive when perceived similarity conveys information about similar goals, which is important for the coordination and the pursuit of these goals.

Value Similarity in Romantic Relationships

Popular culture and dating sites propagate the importance of finding a perfect match as the recipe for romantic success. There are affirmative claims that “birds-of-a-feather flock together”, highlighting the importance of partner similarity for relationship functioning. Meanwhile, there are contrary claims that “opposites attract”, highlighting how partners’ personalities should complement each other, rather than being similar. The unresolved nature of this discussion in the public eye can be revealed by Google searches for “*opposites attract*”. When I first typed in this term (05, 2018), the search revealed two newspaper articles referencing scientific work, independently arriving at different conclusions. The first piece, from the UK newspaper, The Telegraph (Knapton, 2016), references work by Angela Bahns and colleagues (Bahns et al., 2012), who found that friends and romantic partners almost always held more similar attitudes than would be expected by chance. However, the next newspaper headline, from the Daily Mail, exclaims “Opposites DO attract” (L. Watson, 2013), referencing Frost and Forrester's (2013) findings that others can be too similar to us, or too close.

Although these two articles are mere examples of the contradictory findings, it is worthwhile to expand on the four differences between those two articles because they exemplify important nuances in the methodologies used by research on psychological similarity, and these nuances may be responsible for contradictory findings with limited generalisability. First, the research targets different samples. Bahns et al.'s (2012) sample consisted largely of friendship dyads, while investigating attraction and partner liking. Meanwhile, Frost and Forrester (2013) sampled romantic couples, studying relationship maintenance and relationship quality. While the role of similarity for attraction and liking in early stages of the relationship can be shown fairly consistently (Montoya et al., 2008), the evidence for the role of similarity in maintaining relationships is mixed.

Second, the articles differ in the type of similarity they study. Bahns et al.'s (2012) investigated people who actually had similar personalities and opinions when independently asked, while Frost and Forrester (2013) examined people’s perceptions of their partners’ similarity, without assessing their actual personality. This difference in focus highlights the question as to whether actual similarity and perceptions of similarity matter to different degrees, a topic of much scientific interest (for meta-analysis, see: Montoya et al., 2008).

Third, the articles focused on different dimensions of similarity. Bahns et al. (2012) focused on similarity in attitudes, political opinions, and health behaviours, while Frost and Forrester (2013) discussed mutual perceptions of closeness. When similarity is referred to conventionally, the subject is often similarity in dimensions of personality. For example, the dating website “eharmony” matches individuals based on their similarity in human values

(e.g., benevolence), relationship ideals (e.g., a preference for passionate relationships), or personality traits (e.g., introversion-extraversion; Buckwalter et al., 2009).

Lastly, the way similarity was operationalised in statistical analysis differs between both articles. While Bahns et al. (2012) construed actual similarity as profile correlations between partners' answers, Frost and Forrester (2013) derived their effects by computing algebraic difference scores. While both methods are common in research on actual and perceived similarity, there are arguments to suggest that both are flawed (J. R. Edwards, 1993, 2001).

Acknowledging these nuances, the aim of this thesis is to investigate the effects of actual and perceived similarity in values on relationship quality. To understand these effects, I examine them in the context of actual and perceived similarity in personality traits and relationship ideals, as explained in this chapter. I also deploy polynomial regression and response surface analysis as better ways to analyse effects of partner congruency (J. R. Edwards, 2002; Schönbrodt et al., 2018).

In this first chapter, I provide definitions of key terms and a review of relevant previous literature. The second chapter will present my first academic paper investigating actual value similarity in romantic relationships. The third chapter contains my second academic paper, describing a longitudinal replication of the novel findings described in the second chapter. The fourth chapter addresses open questions in the research on perceived similarity and presents a new theoretical framework on how perceived similarity is connected to relationship quality in a series of three studies. Lastly, I will present concluding thoughts on the role of value similarity in relationships, highlighting gaps of knowledge and suggesting how they could be addressed by future research.

Chapter Overview

In the first half of this chapter, I will define some key terms and the scope of the research question. Although my focus is on similarity in human values, I will consider psychological similarity in relationships more broadly to set the context. I will present definitions for actual and perceived similarity and explain the unique aspects of romantic relationships compared to other dyadic relationships (i.e., friendships) in regard to effects of psychological similarity. I will also define relationship quality, the outcome of interest, as a multifaceted set of cognitive and affective relationship evaluations. In reviewing the literature, I will show how research has arrived at different conclusions using a wide range of samples (Dyrenforth et al., 2010; Luo, 2009; Roberts & Robins, 2000) and methods for measuring personality and computing similarity (Dymond, 1954; Eysenck & Wakefield, 1981; Luo & Klohnen, 2005; Robins et al., 2000), all with their own limitations. I will then summarise newer studies examining personality similarity with polynomial regression (J. R.

Edwards, 2001; Schönbrodt et al., 2018) and note how these fail to find similarity effects for values (Leikas et al., 2018). However, these newer studies have their own limitations, such as unreliable outcome measures and homogenous samples. Thus, one aim of the present research is to fill this gap and provide the first investigation of value similarity in a sample of mostly early dating relationships, using polynomial regression.

This first half of the chapter will foreshadow a central argument to this thesis, which is that the direction, strength, and causal path of psychological congruence between partners depends on the dimension in which it is actually measured or perceived. Values are important dimensions of similarity because they relate to abstract goals (Schwartz, 1992), and agreement on those abstract goals might help partners to coordinate their goal pursuits (Fitzsimons et al., 2015). Simultaneously, personality traits are important because they are behavioural dispositions, and similarity in them might facilitate understanding and minimise conflict (Karney & Bradbury, 1995). Yet, values and traits differ both conceptually and how they are measured. To help to compare and contrast their effects, I will introduce a theoretical and empirical framework developed by Hanel and Maio (2020).

The second half of this introductory chapter will focus on perceived similarity. Like the research with actual similarity, research on perceived similarity has rarely investigated values (Hebb, 2005; Murray et al., 2002; Wu, 2010), or relationship ideals (Avivi et al., 2009; Muraru et al., 2017; Preotu & Turliuc, 2013), but has frequently investigated traits (Amodio & Showers, 2005; Barranti et al., 2017; Dymond, 1954; Hudson & Fraley, 2014; Luo & Snider, 2009; Lutz-Zois et al., 2006; Morry et al., 2011; Murray et al., 2002; Murstein & Beck, 1972; Tidwell et al., 2013). Also like the research on actual similarity, samples and methods are diverse, leading to some contradictory results. Further, research has not compared the effects of perceived similarity in various individual difference dimensions within the same sample. This is an important oversight, as observing a difference between dimensions would help the creation and improvement of theories about why and how perceived similarity between partners relates to the quality of their relationship.

Disambiguation and Definitions

Before reviewing the literature, I want to establish the boundaries of my research. As noted above, past research on similarity in romantic relationships has looked at a variety of definitions and operationalisations for similarity, relationships, and relationship quality. This has led to a wide variety of results that are often difficult to compare and connect (as I will argue below). It is therefore important for any research on dyadic processes to precisely define concepts in order to enhance the comparability of future research. This section aims to provide the necessary background and definitions.

Actual and Perceived Similarity

I define actual similarity as *the extent to which two individuals share specific characteristics, disregarding whether they perceive this to be the case*. In research on psychological similarity between relationship partners, it is often operationalised as some measure of difference or overlap between two partners' individual personality self-reports (e.g., Decuyper, De Bolle, & De Fruyt, 2012) or their interaction (e.g., Russell & Wells, 1991). In theory, actual similarity influences relationship quality because it leads to synchronised or (implicitly) coordinated behaviour, whether be it due to sharing abstract goals (i.e., values) or behavioural dispositions (i.e., traits). This synchronised behaviour might be beneficial for relationship quality if behaving in similar ways is advantageous, perhaps because behaving similarly makes a partner easier to understand (Anderson et al., 2003), preventing relationship conflict or stress (Karney & Bradbury, 1995). In addition, similar goals may be easier to coordinate (Shteynberg & Galinsky, 2011), helping partners to reach their goals (Fitzsimons et al., 2015).

I define perceived similarity as *the degree to which individuals perceive their partners to possess shared characteristics, disregarding whether the partners actually possess these characteristics*. Perceived similarity is often measured as the difference or overlap between an individual's self-rating and their rating of their partner on the same items. Previous theories have assumed that perceived similarity affects relationship quality because it signals positive qualities (e.g., "being a good person") about the partner (Ajzen, 1974; M. F. Kaplan & Anderson, 1973), and these positive qualities influence the evaluation of the relationship with the target.

The distinction between actual and perceived similarity is important because their influences on relationship quality are likely to be independent. Two meta-analyses (Montoya et al., 2008; Montoya & Horton, 2013), collating over 40 years of research, have shown that perceiving other people as similar to oneself has positive interpersonal consequences, such as attraction/liking and positive evaluation, while this is not the case for actual similarity in ongoing relationships. The perceptions of similarity are likely influenced by illusions of similarity, that is egocentric assumptions about the partner's personality, and not based on accurate observation (Murray et al., 2002).

In sum, the likelihood of different processes underlying the effects of actual and perceived personality similarity on relationship quality make the distinction necessary. While actual similarity might be beneficial because it encapsulates behavioural synchronicity and coordination, perceived similarity might be beneficial because it signals received positive partner qualities, such as the agreement and support for one's own personal goal pursuits. These points will be expanded in this chapter and subsequent chapters.

Romantic Relationships

The differentiation between romantic relationships and other dyads is important due to high interdependence between romantic relationship partners (Berscheid et al., 1989; Morry et al., 2011). Interdependence refers to the degree to which the partners' individual goal pursuits depend on one another's actions (Rusbult & Van Lange, 2003). The theory of transactive goal dynamics (Fitzsimons et al., 2015) describes a similar concept, which is termed transactive density. Transactive density describes the extent to which partners' goals, pursuits, and outcomes affect the other person. Interdependence and/or transactive density may moderate the impact of both actual and perceived similarity in relationships. Regarding actual similarity, this may facilitate smooth interaction and coordination, but depend on the level of interdependence. The more interdependent the relationship, the more important is understanding and successful coordination of partner behaviours, and thus actual similarity, to relationship quality.

At the same time, however, the link between actual similarity and relationship quality is potentially more complex because greater interdependence also creates more commitment (Sabatelli & Cecil-Pigo, 1985), which might buffer some of the negative effects of failed coordination. As partners become interdependent, they become motivated to maintain a stable relationship with one another (Rusbult & Van Lange, 2003). This interdependence comes with costs to autonomy, leading people to engage in commitment-insurance processes (Murray et al., 2009). These processes entail developing positive illusions about their partner upon contemplation of relationship costs, such as those caused by incompatible behaviour or goals. Thus, the degree to which incompatible behaviours affect relationship quality might be skewed by positive illusions, which may be particularly marked in relationships with high interdependence.

With regards to perceived similarity and relationships, perceptions of similarity are often not accurately perceived, but egocentric illusions (Murray et al., 2002). People might construct these similarity illusions because they harbour beliefs about the importance of similarity. Morry's (2005; Morry et al., 2011) work on the attraction-similarity hypothesis shows that positive evaluations of partner and relationship will cause perceptions of similarity in different trait dimensions to the extent that similarity in the dimension is believed to be important for relationship functioning. In other words, if people assume similarity in (for example) values to be important for functioning relationships, and find themselves in a functioning relationship, they may assume that their partner possesses similar values to themselves.

There is evidence that people perceive similarity to be of differential importance depending on the type of relationship. Sprecher and Regan (2002) asked 700 college students about the characteristics they would prefer in a friend, dating partner, or spouse.

Their results indicated that people perceive similarity in demographics (i.e., race, class, religion), attitudes and values, and social skills, to be significantly more important for functioning committed romantic (i.e., dating, and marital) relationships than for functioning friendships. Interestingly, their results showed no difference in preference for similarity in personality traits depending on relationship type.

In sum, this thesis will focus on romantic relationships exclusively because the findings obtained from similarity-relationship quality research cannot easily be generalised to other relationship types. Romantic relationships are particularly high in interdependence and commitment, which may magnify the effects of actual (dis)similarity, while buffering some of the negative effects of perceived incongruency through commitment-insurance processes (Murray et al., 2009). Individuals also tend to attribute more importance to similarity with a romantic partner than to similarity with a friend, which can influence the connection of perceived similarity to relationship quality, as stated by the attraction-similarity hypothesis (Morry, 2005).

Relationship Quality

Previous literature varies widely in the operationalisation of relationship quality. Some studies assess it with unidimensional questions about satisfaction or happiness (Bleske-Rechek et al., 2009; Dymond, 1954; Dyrenforth et al., 2010; Glicksohn & Golan, 2001; Leikas et al., 2018; Neyer & Voigt, 2004) or frequency of relationship behaviours (Decuyper et al., 2012; Eysenck & Wakefield, 1981; Gonzaga et al., 2007; Gray & Coons, 2017; Humbad et al., 2013; Lewak et al., 1985; Luo & Klohnen, 2005; Murstein & Beck, 1972; D. Watson et al., 2004; Weidmann, Schönbrodt, et al., 2017). Other studies ask about the evaluation of the partner, instead of the relationship (Dyrenforth et al., 2010; Solomon & Jackson, 2014; Tidwell et al., 2013) In this thesis, I will maintain a definition that is (1) multidimensional (rather than unidimensional), and (2) based on relationship evaluations, (rather than evaluations of relationship behaviour or evaluations of the partner).

Evaluations of dyadic relationships are inherently multidimensional. When asked to evaluate one's relationship, one could evaluate satisfaction, commitment, a feeling of trust, or sexual passion. This is not to say that there have not been successful unidimensional scales of relationship satisfaction (rather than quality) with sound psychometric properties (e.g., Funk & Rogge, 2007). The problem is that studies have also shown that similarity effects can vary depending on the dimension of relationship evaluation. One example is from a study on personality similarity in romantic couples (Barelds & Barelds-Dijkstra, 2007), which obtained different dyadic effects depending on the outcome measure within the same sample. Therefore, a measure focusing on one dimension alone might miss effects of similarity or find effects that do not generalise to other dimensions of relationship quality.

To address this issue, I will therefore use the Perceived Relationship Quality Component Questionnaire (PRQC; Fletcher et al., 2000). The PRQC assesses relationship evaluations on satisfaction, commitment, intimacy, trust, passion, and love. Fletcher et al. (2000) showed that these subscales are sufficiently interrelated to justify combining them into one overall assessment of relationship quality, while capturing diverse aspects of overall relationship quality without undue focus on one isolated aspect. Here, my aim is not to evaluate outcomes of similarity for each dimension of relationship quality, but to capture effects that appear *across* dimensions. This cross-dimensional focus arises because there is no strong *a-priori* basis for expecting different effects on the strongly interrelated subdimensions. Differences between the interrelated subdimensions is a matter for future investigation focused on hypotheses about these differences, and therefore beyond the scope of this thesis (but is made possible by sharing data from the PRQC).

As the name suggests, the PRQC is a measure of *perceived* relationship quality. This focus differs from more behaviourally focused self-report measures of relationship quality, such as the much-used dyadic adjustment scale (Spanier, 1976) or the marital adjustment test (Locke & Wallace, 1959), which assesses the frequencies of positive or negative interactions. Measuring quality through behavioural interaction is not only theoretically cumbersome (as spouses tend to inaccurately remember interactions; Floyd & Markman, 1983), but also unsuitable for our purposes, as it blurs the boundary between predictor (i.e., the behaviour displayed in partner interaction, potentially caused by personality similarity) and outcome (i.e., relationship quality). Because the PRQC is devoid of behavioural report, it avoids these theoretical and psychometric pitfalls.

I also conceptualise relationship quality as an evaluation of the relationship first and foremost, rather than attitudes towards the partner. While some studies on romantic relationship quality have used similar measures (Dyrenforth et al., 2010; Solomon & Jackson, 2014; Tidwell et al., 2013), partner evaluations are most commonly found in the experimental attraction-similarity literature, where the similarity of a fictitious other is manipulated and the attitude towards the other is measured (e.g., Byrne et al., 1971). I argue that cognitive and affective evaluations of the relationship are more diagnostic of ongoing relationship maintenance than is mere evaluation of the partner. That is not to say that evaluations of relationship partners are unimportant. The issue is that evaluations of relationships include and go beyond evaluations of partners. Empirical research typically finds that these evaluations (using positive adjectives to describe the partner, such as “supportive”, “considerate”, or “kind”) only moderately correlate with evaluations of the relationship as a whole, while evaluations of relationships have a much stronger link to actual positive interaction than partner evaluations (LeBel & Campbell, 2013).

In sum, I define the concept of relationship quality as multifaceted (as similarity has been shown to impact different components of relationship quality), related to cognitive and affective evaluations of a relationship (rather than psychometrically inadequate and theoretically confounding frequencies and qualities of dyadic interactions), and evaluative of relationships rather than partners (as the latter only captures a subset of the former).

Methodological Issues

Published papers differ widely in how they operationalise and analyse psychological similarity. Most frequently, similarity is operationalised as some form of difference score between self-reports (Avivi et al., 2009; Barelds, 2005; Barelds & Barelds-Dijkstra, 2007; Decuyper et al., 2012; Dyrenforth et al., 2010; Eysenck & Wakefield, 1981; Gattis et al., 2004; Gaunt, 2006; Glicksohn & Golan, 2001; Hudson & Fraley, 2014; Lewak et al., 1985; Luo, 2009; Luo et al., 2008; Medling & McCarrey, 1981; Middleton, 1993; Morry et al., 2011; Muraru et al., 2017; Murstein & Beck, 1972; Nemechek & Olson, 1999; Neyer & Voigt, 2004; Preotu & Turliuc, 2013; Robins et al., 2000; Russell & Wells, 1991; Shiota & Levenson, 2007; Solomon & Jackson, 2014; Tidwell et al., 2013; D. Watson et al., 2004; Zhou et al., 2017). In other articles, the correlations between participants' profiles on a trait dimension are examined, with higher correlations indicating higher similarity (Bleske-Rechek et al., 2009; Decuyper et al., 2012; Dyrenforth et al., 2010; Furler et al., 2014; Gaunt, 2006; Gonzaga et al., 2007; Gray & Coons, 2017; Hebb, 2005; Humbad et al., 2013; Luo et al., 2008; Luo, 2009; Luo & Klohnen, 2005; Luo & Snider, 2009; Murray et al., 2002; Wu, 2010; Zhou et al., 2017). The use of difference scores and profile correlations has become widespread because both approaches allow researchers to operationalise the concept of congruence using a single metric.

However, both of these popular approaches have been criticised. Edwards (1993, 2001, 2002) pointed out that they make untested and restrictive assumptions, omit information about their component scores, lead to false positives through being confounded with main effects of personality, are conceptually ambiguous, and unduly simplify the three-dimensional nature of a congruence effect (see also, Griffin et al., 1999). As a solution to all these problems, Edwards (1993, 2002) suggested the use of polynomial regression and response surface analysis. Before explaining these statistical techniques in detail, I want to provide context by explaining the criticisms of difference scores and profile correlations, highlighting how polynomial regression and response surface analysis can address the shortcomings.

Difference Scores. Probably the simplest conceptualisation of similarity between two ratings is through their inverted difference. This high face validity has made the difference score appear as one of the earliest methods in research on similarity in romantic

relationships (e.g. Dymond, 1954). Difference scores can be calculated in many ways, such as the algebraic difference, squared difference, and absolute difference.

Algebraic difference (D), defined as $D = P_a - P_p$, where P_a is an actor's score and P_p is their partner's score, is the simple difference between two scores and can have positive and negative values. It is often (but not exclusively) used when dyads are distinguishable in some form, in order to make a meaningful distinction between positive and negative differences. As examples, the algebraic difference in romantic dyads could be computed by subtracting each male partner's score from the female partner's score, the older partner's score from the younger partner's score, or each person's self-ratings from partner-ratings.

For similarity hypotheses, linear effects on algebraic difference scores are unsuitable because similarity is not represented by either endpoint of an algebraic difference score. The endpoints are more relevant to superiority hypotheses (Griffin et al., 1999). Superiority models assume that an outcome will be higher when (for example) the actor's value is higher than the partner's value. An example occurs in research on organisational psychology, which finds that managers who rate their own performance lower than their performance is rated by their peers actually tend to perform better (Brutus et al., 1999). While obtaining such an effect signifies a kind of dissimilarity effect, the absence of such an effect (i.e., a null effect) cannot be taken to conclude a similarity effect. This non-informativeness of both endpoints for similarity makes the algebraic scores unsuitable for linearly testing hypotheses about similarity[1].

Quadratic (D^2) and absolute difference ($|D|$) scores are defined as $D^2 = (P_a - P_p)^2$, and as $|D| = |P_a - P_p|$ respectively. Unlike algebraic difference scores, both quadratic and absolute difference scores represent the point of similarity at 0, making it easier to use them to investigate similarity hypotheses. The main difference between quadratic and absolute difference scores is their approach to transforming difference scores leading to different weighting of differences. Squaring the algebraic difference (D^2) gives more weight to larger differences than simply dropping the sign of the algebraic difference ($|D|$).

As explained by Edwards (1993), both quadratic and absolute difference scores make untested assumptions. First, both assume that the effect of similarity on the outcome will be equal regardless of the levels of the component variables. For personality similarity, this would mean that it does not matter whether two people are both high or both low on extraversion. While this would be close to the representation of a true similarity effect, this assumption cannot be tested using difference scores, as the information about the level at which the difference occurs is lost. For research on value similarity specifically, this loss of

[1] However, algebraic difference scores can be used in conjunction with a squared difference score, to see whether relationship quality is maximised at the centre of the score (for an example of this, see: Eysenck & Wakefield, 1981).

information is problematic because the motivational properties of values differ with their centrality to the self (Verplanken & Holland, 2002). More central (i.e., important) values may guide behaviour more than less important values, making similarity more effective if partners jointly rate a value as especially important. This hypothesis cannot be tested with any kind of difference score alone.

Second, because they omit information about the level of its predictors, quadratic and absolute difference scores also fail to distinguish between similarity effects and main effects. Griffin et al. (1999) illustrate this point with an example where dissimilarity in earnings negatively predicts a female partner's rating of the quality of her heterosexual relationship. Because women frequently earn less than men, the majority of income difference scores are negative from the women's point of view. Consequently, absolute difference scores are highly correlated and confounded with the women's *lower* salary and the partner's *higher* salary; the effect does not work in the opposite direction for each partner. This asymmetry is relevant for research on value similarity due to reliable gender differences in the importance of human values (Schwartz & Rubel-Lifschitz, 2009; Schwartz & Rubel, 2005). Therefore, the confounding of difference scores with these main effects is a crucial limitation to consider when studying value similarity in the relationship context.

Difference scores also introduce conceptual ambiguity (J. R. Edwards, 1993). The interpretation of the difference score rests on the assumption that both actor and partner scores contribute about 50% of the variance to it. However, this is the case only if the component scores have equal variance themselves. This variance might often not be equal, and rarely is the variance in the partner scores reported. Admittedly, large differences between partner variances are rare (see Weisberg et al., 2011 for example). Nevertheless, this drawback warrants attention in the interpretation of difference scores.

More of a problem in personality research is the fact that difference scores are, by definition, less reliable than their component scores. Edwards (2002) points out that the reliability of the difference score depends on the correlation of its component scores. The more variance they share, the less reliable the difference score. Shared variance can sharply decrease reliability for transformed, quadratic difference scores. Edwards (2002) illustrates this problem in an example where an algebraic difference score between two component measures is computed, each with reliabilities of $\alpha = .75$, and a correlation between them of $r = .40$. When computing the quadratic difference, its reliability drops to $\alpha = .09$. Although occasions of low reliability in personality factors or value types are to be expected (e.g., tradition values; Schwartz et al., 2001), this level of impact eliminates the utility of the measure. Furthermore, the problem is likely to be frequent because mating assortment (and thus between partner correlation) is the norm for values (Luo & Klohnen,

2005). Therefore, computing difference scores between partners from individual differences is likely to lead to reduce the reliability of the difference score and cannot be recommended.

Profile Correlation. Another way to quantify the similarity between partners is by computing a profile correlation. This can be done by treating each individual profile item as a case (row), and each partner as a variable (column), and computing the Pearson correlation (*r*) between partners. However, as both Edwards (1993) and McCrae (1993) note, Pearson correlation is not a good conceptualisation of similarity, as it only cares about profile shape (i.e., equal deviations from the partner's mean). Thus, two partners can have high profile correlations, while consistently scoring on opposite ends of the scale. This contradiction makes the method incompatible with the general notion of congruence, where equal scores should predict high levels of the outcome variable.

Recognising this problem, McCrae (1993, 2008) developed the profile agreement index (I_{pa}). This index considers both the difference between the two ratings, and the extremeness of the rating (i.e., the average of both partners' absolute rating; see Equation 1).

$$I_{pa} = \frac{k+2\sum M^2-\sum d^2}{\sqrt{10k}} \quad (1)$$

Here, *k* is the number of items in the profile, *M* is the average of the partner's ratings on one item, *d* is the difference between both ratings on an item. All ratings should be z-standardised before computing I_{pa}. Note that this measure was specifically developed to measure personality trait profile similarity. The rationale behind including the extremeness of the rating is that, for personality diagnostics, disagreements near the extremes matter less than disagreements close to the mean (McCrae, 2008).

The I_{pa} can also be converted into a coefficient that resembles the Pearson coefficient. Because the I_{pa} follows a normal distribution (in indices with many items), its significance can be determined by looking at the z-distribution. The conversion can be achieved using the equation for a correlation coefficient z-transformation, solved for *r* (see Equation 2)

$$r_{pa} = \frac{I_{pa}}{\sqrt{(k-2)+I_{pa}^2}} \quad (2)$$

Despite the fact that r_{pa} has been used in several studies investigating effects of personality similarity (e.g., Decuyper et al., 2012), two factors make it conceptually difficult to investigate similarity hypotheses with r_{pa}. First, r_{pa} does not give information about *which* levels of the component variable maximise the effects of similarity. Second, assuming that differences at extreme deviations are less important than differences around the mean might make diagnostic sense, but this assumption is not testable with the score. Together, these issues constrain the types of conclusions that can be drawn using r_{pa}.

Another measure mentioned by McCrae (2008) is the intraclass correlation (ICC). The ICC is estimated through analysis of variance procedures (although it can be calculated in different ways for different designs; McGraw & Wong, 1996). It is the amount of variance explained by organising the personality ratings by individuals. Thus, in crude terms, ICC increases as the sum of differences between partners' ratings decrease. Accordingly, like r_{pa}, the ICC is sensitive to both differences in level of differences and shape of profile. However, the ICC suffers from similar issues as r_{pa}, in that it cannot give information about the level of difference that might matter. One advantage over r_{pa} is that ICC is less biased towards extreme values than r_{pa}. Conversely, one disadvantage is that ICC cannot quantify the difference on a single-item, while r_{pa} can (McCrae, 2008).

A last, well-known issue with profile correlations is that they are sensitive to inflation through normativeness. This issue arises because a normative pattern of responding exists for most individual difference dimensions. For example, most people are likely to evaluate helping others as more important than helping oneself. Thus, a certain degree of the profile correlation is influenced by partners' normative biases. This normativeness might also inflate the association of the profile correlation with the outcome variable because an individual who tends to respond normatively on personality would probably also respond normatively (i.e., highly) on measures of relationship quality (Humbad et al., 2013). For research on value similarity, this issue is also problematic because individuals in a culture generally agree that certain values are more important (e.g., benevolence, self-direction) than others (e.g., power, tradition; ESS Round 8, 2016).

In general, profile correlations have advantages and disadvantages over difference scores. For advantages, profile correlations are largely (although not completely; Luo et al., 2008) independent of main effects of the individual personality scores and tend to be more reliable. However, this advantage comes at a high cost. Profile correlations other than r_{pa} depend on scales that consist of one or more items. Even with r_{pa}, the reliability of the profile similarity score depends on the number of measurements (k) in the profile. This makes profile correlations unsuitable to detect similarity effect in individual value types, if they are only measured by few items (e.g. hedonism, stimulation). Also, profile correlations suffer from redundancy in the profile. This limitation makes them unsuitable to measure similarity

at the level of specific value types, as items measuring a single value type share content. A side effect of this limitation is also that profile correlations are unsuitable for investigating similarity effects that might differ depending on value content (e.g., “is similarity important in some values, but not in others?”).

In sum, despite their widespread usage, both difference scores and profile correlations have issues that restrict their utility for examining the role of value and trait similarity between romantic partners. Linear effects of algebraic difference scores cannot test similarity hypothesis. In general, difference scores often confuse main effects and congruence effects, introduce conceptual ambiguity if means and variances of the compound variables are not equal, and neglect the level of the component score at which the difference might be important. Lastly, when the component scores are positively correlated (as often is the case in dyadic personality research), the reliability of the resulting difference score is consistently lower than that of the component scores. Meanwhile, profile correlations might be less likely to be confounded with main effects and more reliable, but they also discard information about the level of difference, are overly concerned with shape of association, can be biased by normativeness, and are not suitable to investigate similarity effects in specific values (where the scales are made up of only a few, conceptually homogenous items). Therefore, alternative methods are needed to circumvent these issues.

Polynomial Regression and Response Surface Analysis. Edwards (1993) recognised the necessity of construing similarity as the absence of difference (rather than a profile score), but was also aware of the unjustified assumptions and restrictive constraints that accompany difference scores. Edwards (2002) argued that congruency hypotheses should best be understood as independent contributions of combinations of actor and partner scores and started from a linear model that uses a quadratic difference score as a predictor (see Equation 3):

$$Z = b_0 + b_1(X - Y)^2 + e \tag{3}$$

He then used binomial expansion to arrive at (Equation 4):

$$Z = b_0 + b_1X^2 - 2b_1XY + b_1Y^2 + e \tag{4}$$

where *Z* is any outcome, *X* is the actor’s score, *Y* is the partner’s score, and *e* is the error term. Equation 4 shows that using quadratic difference scores essentially means predicting the outcome from the quadratic effects of the partners’ scores and their interaction. The

problem is the inclusion of two restrictive constraints. Firstly, all terms are constrained to having the same slope (b_1). Secondly, the slope of the interaction term is constrained to be opposite in sign to the quadratic main effects and twice as large. Lifting these constraints and adding the linear main effects (as unbiased estimation of non-linear or squared terms requires inclusion of their constituent terms), Edwards (2002) arrived at the full polynomial regression equation (Equation 5):

$$Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e \quad (5)$$

It lets both actor and partner scores independently predict the outcome, thus not confusing congruence effects with main effects. Furthermore, without combining actor and partner scores, issues of conceptual ambiguity and reliability are avoided. The model also has advantages over the use of profile correlations, as it does not have to be used on large profiles. It can be used with value types and can test predictions about the point at which similarity might be most important, due to combining quadratic effects and main effects. The inclusion of quadratic effects also allows modelling of a perfect similarity effect, one where the outcome is maximised to the same extent regardless of the level of the component measure. In this manner, the polynomial regression circumvents the above discussed issues associated with difference scores and profile correlations.

Polynomial regression faces a special challenge in dyadic datasets, where partners' outcomes (i.e., their relationship quality ratings) will not be independent. This interdependence violates an assumption of ordinary least-squares models, because errors will also not be independent, leading to false positive results (Musca et al., 2011). To account for this issue, Cook and Kenny (2005) presented the actor-partner interdependence model (APIM), a multilevel model which predicts an outcome from actor and partner effects individually, while allowing the intercept of each couple vary randomly (Kenny & Kashy, 2015; see Equation 6)

$$Z_{ij} = \beta_0 + \beta_1X_{ij} + \beta_2Y_{ij} + r_j + e_{ij} \quad (6)$$

Where the subscript *i* refers to any individual within couple *j*, while *r* represents the deviation of the intercept of couple *j* from the overall intercept β_0. Thus, each couple is allowed to have its own intercept, controlling for interdependence, while the effects of the predictors are set to be equal across all couples and individuals (i.e., fixed effects). This logic can be also applied to the polynomial regression model (Schönbrodt et al., 2018) by including the interaction term

and non-linear terms (see Equation 7), and this is the model I will use to investigate similarity effects in dyadic couple relationships.

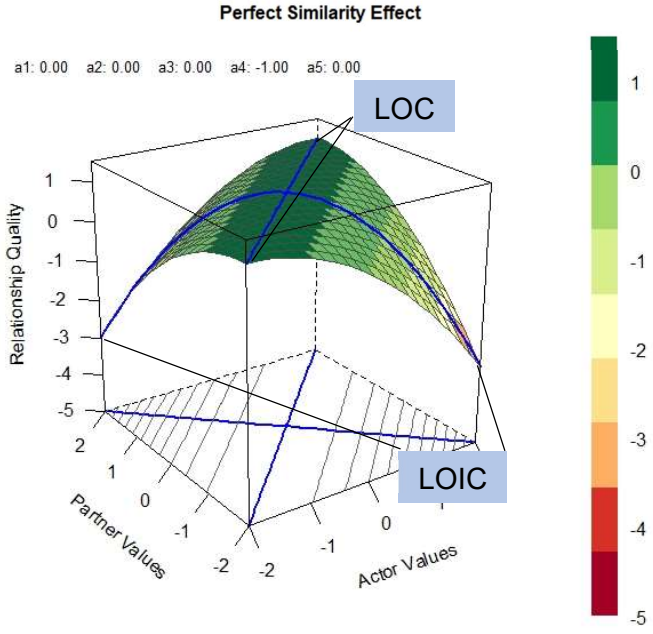
$$Z_{ij} = \beta_0 + \beta_1 X_{ij} + \beta_2 Y_{ij} + \beta_3 X_{ij}^2 + \beta_4 XY_j + \beta_5 X_{ij}^2 + r_j + e_{ij} \quad (7)$$

The root issue that Edwards (2002) saw with difference scores and profile correlations is that they force a fundamentally three-dimensional relationship (actor score, partner score, and relationship quality) into a two-dimensional one (difference score/profile correlation and relationship quality). Because polynomial regression sustained this three-dimensional nature, he suggested that the results of polynomial regressions should be displayed as three-dimensional response surfaces. Features of the response surface can be calculated from the fixed effects ($b_1 - b_5$), and these response surface parameters can be statistically tested to gain robust information about the shape of the dyadic relationship.

For example, the response surface in Figure 1 shows a perfect similarity effect. One of the descriptive features of the response surface is called the line of congruence (LOC), which runs along the points where both actor and partner scores are equal. Another descriptive feature is the line of incongruence (LOIC), connecting the points where actor and partner scores are most different. To describe the response surface, researchers look at linear and quadratic effects on the LOC or LOIC using four response surface parameters (a_1 - a_4; portrayed below the title of Figure 1) calculated from the regression fixed effects. A linear effect on the LOC is captured by the surface parameter a_1. If a_1 is significantly positive (or negative), the LOC indicates a rising (or falling) ridge, such that similarity on higher (or lower) levels of the score relates to higher relationship quality than similarity on lower (or higher) levels of the score. A significant a_1 might indicate a single main effect (Figure

Figure 1

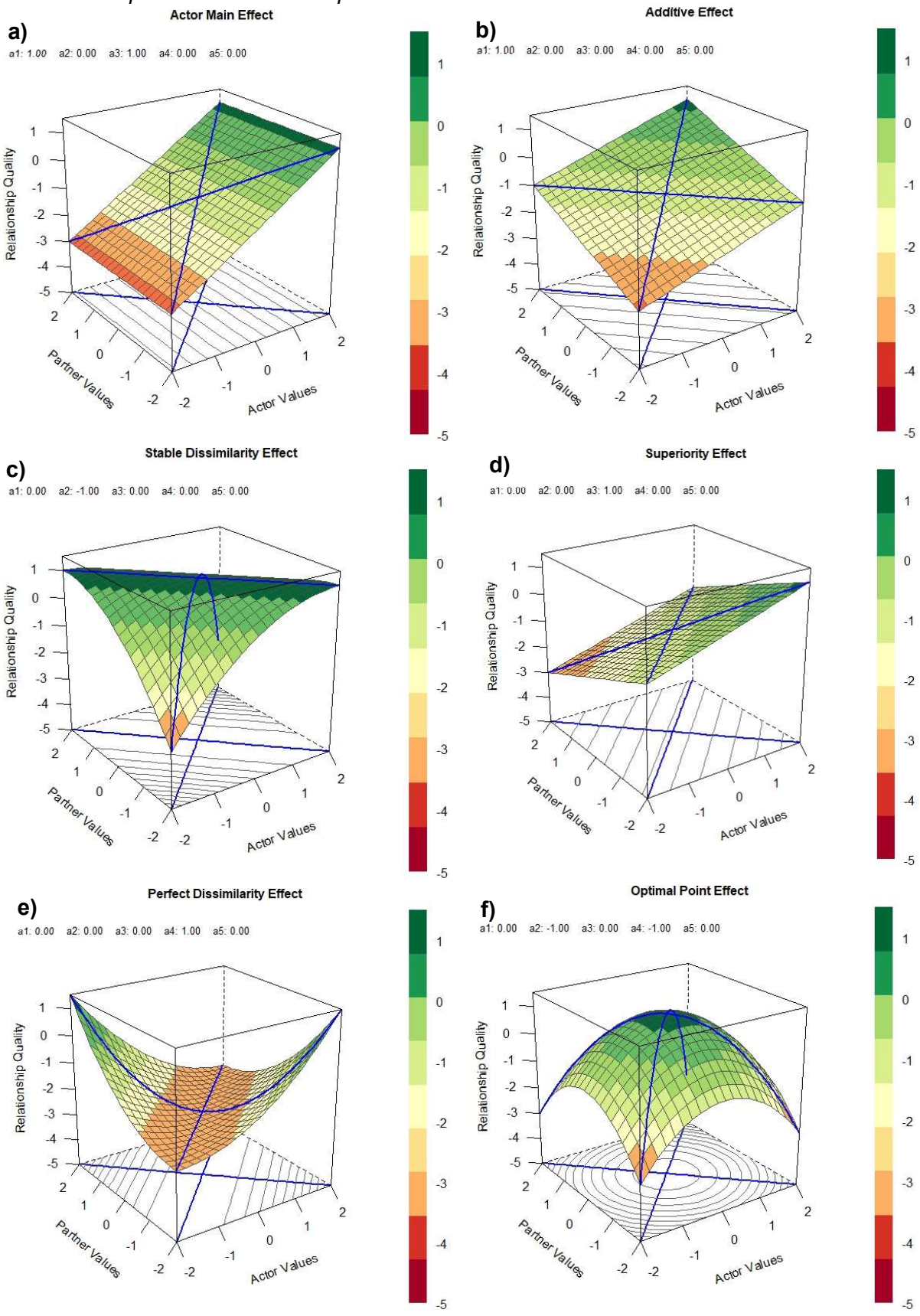
Response surface of a perfect similarity effect



Note. The LOC is shown on the ridge, while the LOIC curves from the left end to the right end of the plot (i.e., x = -2|y = 2 to x = 2|y = -2).

Figure 2

Hypothetical Response Surface Examples



2a) or an additive effect (Figure 2b), where both partners' scores independently affect relationship quality in the same direction.

Likewise, a quadratic effect on the LOC is portrayed by the parameter a_2. If it is significantly positive (or negative), it indicates that similarity in the centre of the LOC is related to lower (or higher) relationship quality than similarity at the LOC's edges. However, a significant a_2 in isolation might indicate a stable dissimilarity effect (Figure 2c), where relationship quality is maximised when partners' scores are opposites. This is not a true dissimilarity effect, because true dissimilarity would need relationship quality to also be low around X = Y = 0, a point which is on the LOIC, but indicates similarity. A positive (negative) parameter a_2 thus shows primarily that relationship quality is high (low) when partners are either average or opposites.

The parameter a_3 indicates a linear effect on the LOIC. A significant a_3 in isolation might indicate that actor and partner scores have opposite effects, forming a superiority shape (Figure 2d). A positive a_3 shows that relationship quality is higher when the actor's score is higher than the partner's score. Conversely, a negative a_3 shows that relationship quality is higher when the partner's score is higher than the actors. This opposition is what an algebraic difference score would test by default.

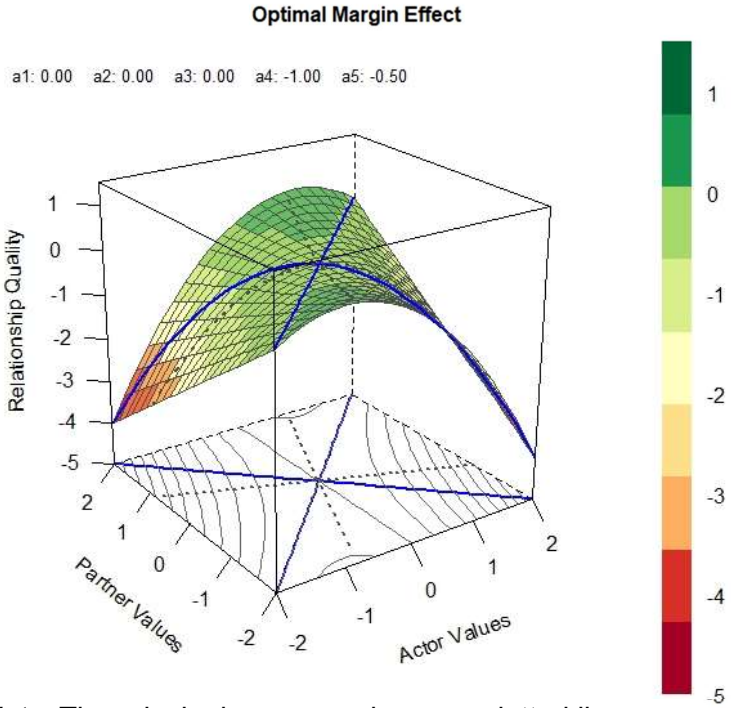
Lastly, the parameter a_4 indicates a non-linear effect on the LOIC. When seen in isolation, a significantly positive a_4 can be indicative of a similarity effect as seen in Figure 1. In the case of a perfect similarity effect, the LOIC is negatively curved, because relationship quality decreases as combinations move further from similarity (the LOC). In contrast, a positive a_4 in isolation can indicate a true dissimilarity effect (Figure 2e), where relationship quality is minimised as a function of similarity and increases the further partners' scores differ from similarity.

However, deduction of similarity and other congruence effects from the three-dimensional space is complicated by a variety of shapes that might easily be mistaken for a similarity effect. One such shape is commonly referred to as a dome (Figure 2f; also called a bowl if inverted; Schönbrodt et al., 2018). Dome (or bowl) shapes are the result of actor and partner quadratic effects in the same direction without an interaction. Such shapes are an example of an optimal point model, which indicates that there is one specific combination of actor and partner personality that leads to maximal (or minimal) relationship quality, with every deviation from this point relating to a decrease in relationship quality. In contrast, similarity effects require an interaction in the opposite direction of the quadratic effects (cf. Equation 4), and relationship quality must also be maximised along the LOC. In addition, there are other parameters to be considered. The ridge of the response surface, where relationship quality is maximised, is represented by the parameters of the first principal axis, p_{10} and p_{11}. The first principal axis can be thought as the shadow of the ridge drawn on the

floor of the response surface. It is thus a two-dimensional line in actor-partner space with an intercept (p_{10}) and a slope (p_{11}). If the ridge follows the LOC, its intercept (p_{10}) should be close to 0 and its slope (p_{11}) should be close to 1 (Humberg et al., 2019). If p_{10} and p_{11} do not indicate the ridge to follow the LOC, but most other indicators ($a_1 = a_2 = a_3 = 0$, $a_4 < 0$) point to a similarity effect, the pattern represents an optimal margin model. The specific optimal margin pattern in Figure 3 is the result of one quadratic effect being stronger than the other[2], and an interaction term carrying the opposite sign being present. The model suggests that for actors low in a certain human value score, it is better to have an even lower scoring partner, while high scorers benefit from having an even higher scoring partner, possibly suggesting that individuals cope best when their partner is a more extreme version of themselves.

Figure 3

Response surface of an optimal margin effect.



Note. The principal axes are shown as dotted lines on the floor of the graph. For a perfect similarity effect, they would have to be aligned with the LOC and LOIC respectively.

Polynomial regression and response surface analysis have two important assumptions that must be met before they can be used (J. R. Edwards, 2002). First, the two concept scores need to be commensurate, meaning they express content of the same dimension. For my purpose, this means that actor and partner ratings must be of the same psychological content. Second, measures must share a common point of 0 and be measured on the same scale. This measurement is normally achieved by either subtracting the centre of the scale from each score, or standardising. To comply with this assumption and to create comparable coefficients, each predictor and outcome in polynomial regression will be z-standardised in this thesis.

Despite all its strengths, polynomial regression and response surface analysis also have some disadvantages (J. R. Edwards, 2002). For the purposes of this thesis, the most significant among them is that congruence can only be the predictor, never the outcome. Polynomial regression (like all regression methods) only predicts one single outcome from a

[2] The difference between the quadratic effects is also shown by the response surface parameter a_5.

set of (dyadic) predictors. Particularly, this limitation makes it difficult to use polynomial regression for longitudinal research, when trying to disentangle causal pathways by switching predictors and outcomes across time. In a later chapter of this thesis, we aim to observe the effects of similarity over time while recognising the shortcomings of alternative similarity metrics. Because polynomial regression is unsuitable for this purpose, we will constrain our response surface analyses to observations within waves. The insights from consecutive cross-sectional analyses are still valuable, as they will still allow us to see the temporal stability of any congruence effects we might initially discover, providing internal replication.

A second disadvantage relates to the sensitivity to measurement error (J. R. Edwards, 2002), which introduces bias in the results, especially for the higher order terms included in polynomial regression models. A high sensitivity to measurement error is problematic for the research described in this thesis. Values are situated along a continuum without objective cut-offs separating them in terms of content (Schwartz, 1992; for a more detailed explanation about the structural organisation of values, see chapter on the theoretical effects of human values in relationships below). Therefore, scores made by summing across neighbouring values often have mediocre reliability (Bardi et al., 2014). The presence of this drawback reinforces the need for further replication of any effects of value congruence reported and replicated here.

Notwithstanding these caveats, polynomial regression and response surface analysis provide an improvement on difference scores or profile correlations. They do not lose information about the importance of the level at which similarity is positively related to relationship quality, estimate main effects, quadratic effects, and the interaction, avoid issues with conceptual ambiguity and reliability, and can be conducted on both scales with many or few items. All of these advantages make polynomial regression with response surface analysis the best choice for the cross-sectional investigation of effects of actual similarity on relationship quality.

Past Effects of Actual Similarity

Having described the relevant terminology and methods, the following pages will present an overview of past research examining actual similarity and relationship quality. Before looking at past literature, it is important to examine contemporary conceptualisations of human values and personality traits in more detail, and why similarity in these individual difference dimensions should affect relationship quality. After addressing these issues, my literature review will illustrate how past methodological gaps have led to varying conclusions about the importance of partner similarity for relationship quality.

Theoretical Effects of Human Values in Relationships

Contemporary psychological research regards values as individual differences in the beliefs about the importance of certain abstract goals, which transcend specific situations and guide individual behaviour (Feather, 1995; Schwartz, 1992, 2012; Schwartz & Bardi, 2001). The earliest conceptual framework of values dates back to Münsterberg's (1908) work on the *Philosophy of Values* [German: Die Philosophie der Werte]. Contrary to the modern understanding of human values, these *pure values* were meant to represent things of objective worth, independent of personal desire. Categorised in a four-by-two grid, the model distinguished between life values (which immediately exist without needing to be created by humans) and cultural values (which are created by humans beyond that which immediately exists) on one side. The other side distinguished between logical values (evaluations of existence and logical connections), aesthetic values (evaluations of beauty and passion), ethical values (evaluations of ongoing developmental processes), and metaphysical values (evaluations of transcendent unity).

The modern conceptualisation of values is closer to Spranger's (1921), who understood values as life-long abstract goals (Wagner, 2002). According to Spranger (1921), individuals differ in the importance they assign to six main types of values, namely theoretical (valuing discovery of truth), economic (valuing what is useful), aesthetic (valuing form and harmony), social (valuing love of others), political (valuing power), and religious values (valuing tradition and unity).

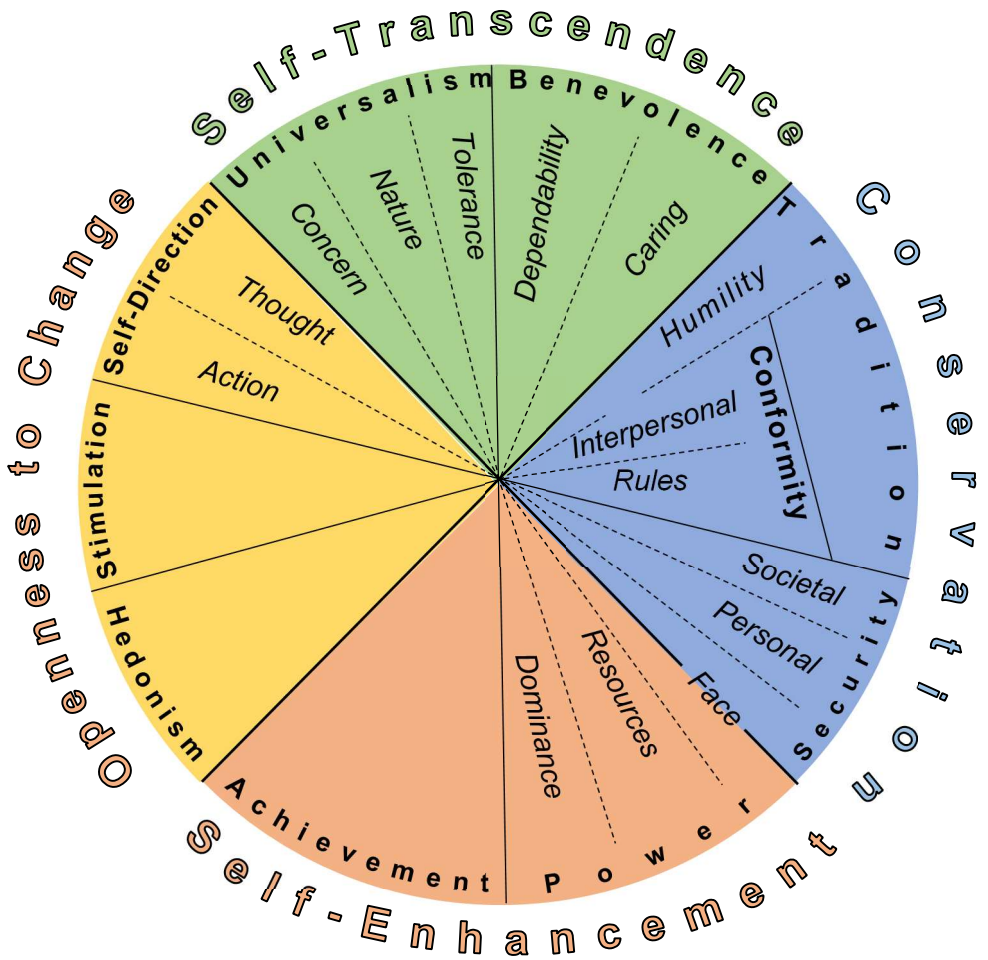
Despite this conceptual similarity, contemporary value theory has its roots in Rokeach's (1973) theory on the nature of human values. This theory conceptualises values as desirable modes of conduct (i.e., instrumental values) or end-states of existence (terminal values) that are trans-situationally stable, while guiding actions and judgements beyond immediate desires. Within the individual, these values are organised hierarchically in terms of their importance, and the capacity to direct behaviour is derived from their relative standing within the value hierarchy. To obtain a picture of individuals' value hierarchies, the Rokeach Value Survey (RVS) asked participants to rank 18 instrumental values (e.g., cheerfulness, honesty, or obedience) and 18 terminal values (e.g., mature love, happiness, or equality) in order of importance.

Rokeach's (1973) theory influenced the most widely cited universal theory of basic human values, conceptualised by Schwartz (1992). According to this theory, different values express different motivational content, which can be organised along two orthogonal dimensions (Figure 4) contrasting the higher-order value types of self-transcendence (improving the welfare of other people and the environment) versus self-enhancement (improving one's own welfare, success, or pleasure), and openness (pursuing sensual gratification, excitement, and freedom) versus conservation (i.e., exercising self-restraint for

the safety and stability of the self, society, and traditions). These higher-order types can be subdivided into 10 lower-order types. Self-transcendence contains motivational content related to universalism (enhancing the welfare of all people and nature) and benevolence (enhancing the welfare of people close to oneself). Conservation contains motivational content related to conformity (self-restraint to prevent harming others, or breaking rules), tradition (self-restraint to uphold and conserve traditions, rites, and culture), and security (self-restraint to prevent harm to come to oneself or the society one lives in). Self-enhancement contains motivational content related to power (obtaining and maintaining wealth, status, and social influence) and achievement (obtaining and maintaining success as defined by societal standards). Lastly, openness contains motivational content related to hedonism (obtaining pleasure and sensual gratification), stimulation (pursuing excitement and novelty), and self-direction (pursuing the freedom to think and act independently).

Figure 4

The value circumplex of the extended Schwartz model



Note. Colour-coded sections represent the four higher-order value types, while the ten classical value types are written in bold. Subtypes of the extended model are written in italics.

Values are arranged in the circumplex model based on their empirical correlation with all other value types in multidimensional scaling analyses. The more positively two values are correlated, the more closely they are placed together. Conversely, the more negatively certain values are correlated, the further they are placed apart. In this manner, the position of value types in the circumplex model also communicates complementarity with other value types. It is important to note that value content is organised in a continuum, like the spectrum of colours. Boundaries between neighbouring value types are fluid, and this also goes for values that border another across higher-order value types. For example, both benevolence and conformity emphasise enhancing other's welfare while supressing selfish impulses.

This continuous property also means that the 10 value types described above can be further divided into smaller sets, described by Schwartz et al. (2012) when he revised the theory. Universalism was split into concern (equality, justice, and protection for all people), nature (preservation of the natural environment), and tolerance (acceptance and understanding of those who are different from oneself). Benevolence was split into dependability (Being reliable and trustworthy) and care (being devoted to the welfare of close others). Humility (recognising one's insignificance in the grand scheme of things) was split from tradition, and conformity was shown to contain content pertaining to interpersonal conformity (avoiding to upset or harm others) and rule conformity (complying with rules, laws, and obligations). Security contains content related to societal security (safety and stability in the wider society) and personal security (safety in one's immediate environment). Power was split into a subtype related to power over (material and social) resources and social dominance (control over people). A subtype relating to preserving face (maintaining one's public image) was split from power and represents a bridge between self-enhancement and conservation. Lastly, self-direction can be subdivided into self-direction of action (freedom to determine one's own actions) and self-direction of thought (freedom to cultivate one's own ideas and abilities).

In most cases, values in the Schwartz (1992, 2012) model are measured with one of two instruments, either the Schwarz Value Survey (SVS; Schwartz, 1992) or the Portrait Value Questionnaire (PVQ; Schwartz et al., 2001). Alternatively, a short-form measure like the short Schwartz Value Survey (SSVS; Lindeman & Verkasalo, 2005) or the Ten Item Value Inventory (Sandy et al., 2017) is used. These measures can be classified according to the way in which they measure values (abstract vs concrete) and their length (long-form vs. short-form measures; Roccas et al., 2017). The SVS is an example of an abstract long-form measure. It comprises 57 items, each of which describes an abstract ideal (e.g., "protecting the environment", "success", "honouring parents and elders"). Participants rate the importance of each item as a guiding principle in their lives on a scale from -1 (representing

that the item is opposed to one's values) to 7 (indicating that the value is of supreme importance). Crucially, this scale is not balanced, but stretched towards the positive side to enhance the distinction between different values, because most values are generally perceived favourably by most people.

The PVQ is an example of a more concrete long-form measure, also comprising 57 items. Each PVQ item describes an individual of the same gender as the participant and asks how similar to that person the participant perceives themselves to be. The rating of values is therefore more indirect, and a typical PVQ item might read "Thinking up new ideas and being creative is important to her/him". The PVQ was created because the circumplex structure failed to replicate in some less developed nations (Schwartz, 1994; Schwartz & Sagiv, 1995). Schwartz et al. (2001) reasoned that this inconsistency might have to do with the abstract nature of the SVS. The PVQ was also the first measure to be used to assess the more narrow subsets of the refined circumplex model as the PVQ-RR (Schwartz et al., 2012). However, it has been argued that the SVS, due to its abstract nature, is a better and more valid measure of values, if used in the right population (Roccas et al., 2017).

A shorter way of measuring the values of the Schwartz (1992) model is the SSVS. Where both longform measures use multiple items to assess each value type, Lindeman and Verkasalo's (2005) SSVS simply asks participants to rate the importance of the 10 values directly. For example, it asks "How important is Achievement (success according to societal standards) as a guiding principle in your life?". This short-form measure was constructed because the time it takes participants to complete a questionnaire is a major issue (e.g., Galesic & Bosnjak, 2009). However, to avoid low reliability from single-item measurement of the 10 value types, the researcher is limited to assessing the four higher-order value types with the SSVS.

Why should values be important for relationship quality? A key factor is that, as abstract goals, value priorities predict the choice of more concrete individual goals. For example, Feather (1995) found that values predicted students' preferences for specific outcomes in predefined scenarios. Students who valued achievement indicated being more likely to study alone the night before an exam, while students who valued universalism would chose to study with another person so they could have good grades too. Verplanken and Holland (2002) showed that the self-centrality (i.e., importance) of individual's values predicted which information they considered when making a choice, and the specific choices they made. Thus, individuals who highly valued protecting the environment were more likely to choose fictitious environmentally-friendly TV sets and vote for a green party in a real election, while individuals who highly valued altruistic values (i.e., being helpful, social justice, equality, true friendship, and mature love) were more likely to donate to a human rights organisation when given the chance. Bardi et al. (2014) found that values even

influence larger goals, such as which job to obtain, which subject to study, or whether to emigrate to a different country.

This relation to personal goals has implications for romantic relationships in several ways. One route is a direct effect of values on the goals applied to these relationships. A recent investigation (van der Wal et al., 2020) has found that self-transcendence values are related to relationship quality because these values predict more intrinsic relationship motivation (i.e., wanting to be in the relationship for one's own sake, not because of outside influences). The motivational content expressed by self-transcendence values also predicts more communal strength (Mills et al., 2004), which is a willingness to respond to the partner's needs for intrinsic reasons (rather than extraneous pressures or expectations of direct reciprocity). These effects of values on relationship goals should be directly conducive to relationship quality.

Another route is through partner similarity in values. Value similarity should matter because shared goals are beneficial for relationships. Jointly pursuing goals often leads people to construct common identities (Gere et al., 2011; Lembke & Wilson, 1998; Paris et al., 1972; Sherif, 1958). In turn, a common identity is construed as an important driver of relationship quality. In interdependence theory (Rusbult et al., 1991; Rusbult & Van Lange, 2003), cognitive interdependence refers to relationship partners' restructuring of their mental representations to see themselves less as individuals, but as a self-and-partner collective, thus enhancing relationship quality. Consistent with this idea, Agnew et al. (1998) found that more committed partners perceived greater unity between their and their partner's self-concept and used more plural pronouns (i.e., "we", "us", rather than "I", "you"). The researchers also found that this effect did not appear in friendship dyads, making it unique to romantic relationships.

Having similar values (and thus aligned goals) might also enhance the coordination of partners' individual goal pursuits. The theory of eudaimonic marital quality (Fowers & Owenz, 2010) puts shared goal pursuit (rather than individual goal pursuit) as one of the most important aspects of a functioning relationship. The theory also singles out constitutive goals, which are goals where the means of attaining the goal and the goals outcomes are inseparable. The theory of eudaimonic marital quality emphasises the importance of pursuing these constitutive goals, rather than individual goals, for relationship well-being. To give an example of a constitutive goal, if one wants to be in an intimate relationship (i.e., which is the outcome of the goal), one has to perform intimate behaviours (i.e., which is the goal's associated means). Following this logic, while similarity in all values could lead to enhanced relationship quality, similarity in self-transcendence related values might be more important because they are more likely to be such shared constitutive goals.

Further, the theory of transactive goal dynamics (Fitzsimons et al., 2015) sees relationships as closed systems with two interdependent subunits (partners) who pursue goals for themselves, each other, and their relationship. I have already introduced the transactive goal dynamics concept of transactive density, which relates to the amount of goal interdependence experienced by partners. High transactive density makes it more important that partners' goals are well-coordinated and that they "fit" because their individual goal pursuits are co-dependent. This fit can be achieved by partners having goals for the same person, such as both partners having personal goals for one partner to lose weight, or both partners having the same goal for their mutual relationship (e.g., buy a home together). Transactive goal dynamics here introduces the idea of interpersonal multifinality, where one partner's goal pursuit automatically supports the other's, perhaps even without explicit coordination. In fact, when partners share the target (e.g., the relationship) and the outcome (e.g., more mutual care in the relationship) for a goal, the effort by one partner to work towards the goal has the potential to directly bring the other partner closer to the goal as well. If goal pursuit does not allow for interpersonally multifinal action, this transactive goal facilitation might need more deliberate planning and negotiating, even if the goals are shared.

While this means that sharing goals should not be beneficial for all goals, as some might be mutually exclusive when shared (e.g., both partners wanting to occupy the same home working space), there is evidence that having similar goals is beneficial for relationship quality. In a diary study of couples' daily goal pursuits, Gere et al. (2011) found that pursuing a similar goal in the presence of the partner is connected to improvements in relationship quality. Relationship quality could also be improved if goal similarity were to reduce goal conflict by making the target or outcome of the goal shared (Gere & Schimmack, 2013). This would be the case especially if the outcome of a particular goal targets the relationship, agreeing on the way the relationship is supposed to go (Muraru et al., 2017; Preotu & Turliuc, 2013).

Associations between Actual Value Similarity and Relationship Quality

Table 1 shows an overview of studies into to the connection of actual value similarity to relationship quality. While the introduction of Schwartz's (1992) value model led to more interest in value similarity, one study on the subject was published before this model emerged. Specifically, Medling and McCarrey (1981) asked 172 married couples to rank their values with the Rokeach Value Survey (Rokeach, 1973). After rankings were converted to interval level data, the absolute difference scores between husbands' and wives' ranks were computed and summed to yield a profile difference score. The results showed no significant effect of value similarity on relationship quality, as measured with the Dyadic Adjustment Scale (Spanier, 1976).

Table 1

Studies of actual value similarity sorted by research period

Study	Sample	Outcome Measure	Value Measure	Operationalisation of Similarity	Associations between Value Similarity and Relationship Quality
Early research period					
Medling and McCarrey (1981)	172 married couples	Dyadic Adjustment Scale (Spanier, 1976)	Rokeach Value Survey (Rokeach, 1973)	Absolute profile difference score between rankings	No associations
Main research period					
Gaunt (2006)	248 married couples	Enriching, Relationship Issues, Communication, and Happiness Scale (Fowers & Olson, 1993)	Schwartz Value Survey (Schwartz, 1992)	Pearson profile correlation and absolute profile difference scores	Positive association of similarity independent of the method of operationalisation
Luo (2009)	117 new couples	Self-made Single-Item Relationship Happiness Measure	17 items from the Rokeach Value Survey (Rokeach, 1973) and the Schwartz Value Survey (Schwartz, 1992) to be rated	Pearson profile correlation and profile absolute difference score, controlling for actor and partner effects	No associations

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Study	Sample	Outcome Measure	Value Measure	Operationalisation of Similarity	Associations between Value Similarity and Relationship Quality
Luo et al. (2008)	536 general population couples	Enriching Relationship Issues, Communication, and Happiness scale (Fowers & Olson, 1993)	Questionnaire of Value Orientation for Chinese (Xin, 2001)	Pearson profile correlations and absolute difference scores in structural equation actor-partner independence models	Positive association of similarity in intrinsic values; No association of similarity in extrinsic values
Luo and Klohnen (2005)	291 married couples	Sum of Marital Adjustment Test (Locke & Wallace, 1959), Relationship Assessment Scale (Hendrick, 1988), and five items on disagreement frequencies in self-report. Answers to interview questions rated by strangers in terms of relationship quality as other report	17 items from the Rokeach Value Survey (Rokeach, 1973) and the Schwartz Value Survey (Schwartz, 1992) to be rated	Pearson profile correlation corrected for stereotypically and absolute profile difference scores	Positive association of similarity, independent of the methods of operationalisation ins men; No association in women

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Study	Sample	Outcome Measure	Value Measure	Operationalisation of Similarity	Associations between Value Similarity and Relationship Quality
Modern research period					
Leikas et al. (2018)	312 parents(-to-be)	Self-made Single-Item Relationship Happiness Measure	Portrait Value Questionnaire(Schwartz et al., 2001)	Polynomial Regression and Response Surface Analysis	Small similarity effect in self-direction, and independent positive actor and partner effects for benevolence and conformity

The next two decades went by without a direct examination of value similarity in relationship quality, until the development of the Schwartz (1992) model led to a resurgence of interest. Studies were then more likely to find positive associations of value similarity using a variety of different outcome measures, often using profile correlations. Studies by Gaunt (2006) and Luo et al. (2008) found evidence for a positive effect of value profile similarity in larger samples of Israeli and Chinese couples. This evidence emerged after a study by Luo and Klohnen (2005) only found a positive similarity effect that was limited to men. Just one other study was unable to find any evidence for the importance of value similarity at the time (Luo, 2009), and this study had a smaller sample of young American relationships and used a single-item outcome measure, hinting at the potential importance of the stage and age of the relationship, the nature of the outcome measure, and the culture that surrounds couples.

Finally, one recent study has utilised polynomial regression and response surface analysis, comparing models with and without a gender split. Leikas et al. (2018) recruited 312 pairs of (expecting) Finnish parents for a study on personality similarity. Respondents answered the PVQ, and relationship satisfaction was measured by a single item. In contrast to the provocative evidence of value similarity effects from previous research (Gaunt, 2006; Luo et al., 2008; Luo & Klohnen, 2005), only a small similarity effect was found. Specifically, similarity in self-direction values predicted slightly better relationship satisfaction, alongside some independent positive actor and partner effects for benevolence and conformity.

However, even this new study has limitations. Firstly, Leikas et al. (2018) could have investigated the four higher-order value types to see if similarity in those broader dimensions matters to a different extent. Arguably, this analysis would have utilised the more reliable level of value measurement. Secondly, Leikas et al. (2018) themselves acknowledge the issue of having a sample of (presumably highly committed) parents. As we will see in the next section, similarity effects are often inconsistent across newer versus older relationships (Dyrenforth et al., 2010; Neyer & Voigt, 2004; Robins et al., 2000; Zhou et al., 2017). Therefore, it is important to also study value similarity in newer relationships, which has yet to be done.

Theoretical Effects of Personality Traits in Relationships

Personality traits are relatively enduring, cross-situationally consistent patterns of thoughts, feelings, action that can be quantitatively assessed (McCrae & Costa, 2009). This quantitative assessment is often done through self-report, with individuals agreeing or disagreeing with descriptive statements and adjectives about themselves. It is assumed that individuals recognise the patterns in their own behaviour and have developed certain words to describe them. This lexical perspective on personality dates back to the infancy of

personality science with Francis Galton (1884), who analysed words in a thesaurus regarding whether they were expressive of “character” and found over a thousand overlapping personality facets. The lexical approach to categorising personality was later used again by Allport and Odbert (1936) to classify 17,953 behaviour-descriptive English words into four categories: generalised and personalised tendencies (or actual personal traits), temporary states of mind and mood, social evaluations, and residual metaphorical or doubtful terms. Later, Cattell (1943, 1945) simplified the four categories (mostly personal traits, but also reincluded words from the other categories) and reduced it down to a list of 171 traits, which produced 12 factors in a factor analysis. Some of these 12 factors included general emotionality and surgency, two factors that would reappear in later reanalysis (Digman & Takemoto-Chock, 1981) as surgency and emotional stability, alongside three other factors labelled agreeableness, dependability, and culture. These were together argued to be the “big five” factors of personality (Goldberg, 1990), following integration with the already existing NEO (Neuroticism-Extraversion-Openness) Model of Personality (McCrae & Costa, 1985).

One of these five factors, extraversion, is a trait that relates to being outgoing, sociable, spontaneous, and lively. While earlier interpretation focused on the energetic and motivated nature of extraversion, more recent investigation also finds a facet within extraversion related to dominance/assertiveness (DeYoung et al., 2007), which was its own factor in Cattell's (1945) classical analysis. Individuals low in extraversion are thus silent, lethargic, and submissive. Alternatively, extraversion has also been related to a greater proneness to experiencing pleasant affect (Argyle & Lu, 1990), not just in social contexts (Lucas et al., 2000). Probably most famously, because of this association with positive affect, highly extraverted people report leading happier and more satisfied lives (Steel et al., 2008). In a meta-analysis of the relationship between the big-five and relationship quality, extraversion had a small, positive association with relationship quality, although it was dependent on culture (e.g., no effect in the USA; Malouff et al., 2010).

A second factor is agreeableness. This trait contains characteristics such as gentle, warm, friendly, and caring. Conversely, individuals low in agreeableness are vindictive, harsh, and ill tempered (Goldberg, 1990). Individuals who self-describe as agreeable prefer constructive responses to interpersonal conflict (Jensen-Campbell & Graziano, 2001), and are more likely to help others in need, whether they are close others or even strangers (Graziano et al., 2007). Agreeableness is one of the traits that has consistently been associated with higher relationship quality in romantic relationships (Karney & Bradbury, 1995; Malouff et al., 2010).

A third factor, conscientiousness, describes orderliness, self-discipline, industriousness, and reliability. Individuals low in conscientiousness are described as

negligent, self-indulgent, rebellious, and inconsistent. Trait conscientiousness has been associated with a range of polite behaviours, such as the punctuality of undergraduate students for research studies (Back et al., 2006), and a range of health-related behaviours such as being physically active, abstaining from unhealthy eating, drugs, tobacco, and alcohol, and even a lower probability of suicide (for meta-analysis, see: Bogg & Roberts, 2004). For romantic relationships specifically, a meta-analysis of behaviour and personality traits found that higher conscientiousness predicted lower rates of marriage dissolution (Roberts et al., 2007).

A fourth factor, emotional stability, refers to resilience and durability, but also insensitive callousness and frankness. Individuals low in emotional stability are often volatile, anxious, depressed, and insecure, which is often summarised as neurotic (DeYoung et al., 2007; Goldberg, 1990). Low emotional stability has been linked to a heightened probability of experiencing clinical depression (Kendler et al., 2004) and heightened vigilance for threatening cues (Zautra et al., 2005). This vigilance is especially present in social situations, where neurotic individuals are more sensitive to signs of deteriorating relationships (Denissen & Penke, 2008). This vigilance might be adaptive for relationship functioning if the neurotic partner is quick to respond and prevent the relationship from deteriorating. Contradicting this possibility, however, emotional stability is the personality trait that is most consistently positively associated with relationship quality (or negatively associated with relationship quality when scored as neuroticism; Karney & Bradbury, 1995; Roberts et al., 2007).

The fifth and last factor, openness to experience, was one of the three dimensions assessed by the three-factor NEO model and showed reasonable correlations with Goldberg's fifth dimension of culture or intellect (McCrae & Costa, 1985). The contemporary big-five model defines individuals high in this dimension as being imaginative, creative, and curious, with a wide range of interests. Individuals low in openness are set in their ways, sticking to what they know. Openness has a unique and interesting connection to general intelligence (Ziegler et al., 2012) and working memory functioning, which has been theorised to be the source of novelty seeking behaviour (DeYoung et al., 2005). However, studies have provided no evidence that open individuals experience more or less quality in their relationships (Karney & Bradbury, 1995; Malouff et al., 2010; Roberts et al., 2007).

Another modern model of the structure of personality adds a sixth factor, honesty-humility. This HEXACO-model (Honesty-humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, Openness) is replicable in several languages and cultures (Ashton et al., 2004). Individuals high in honesty-humility self-describe as honest, modest, humane, and generous, whereas someone low in honesty-humility would be dishonest, boastful, egoistical, and greedy. From these descriptions, it is little surprise that

low honesty-humility is strongly correlated with traits from the dark triad of psychopathy, machiavellianism, and narcissism (Lee & Ashton, 2005). Out of all HEXACO traits, honesty-humility is the only one related to narcissism, a trait which has positive and negative connections to relationship quality, depending on the type of narcissism (Back et al., 2013; Wurst et al., 2017). Honest-humility also shows the strongest correlations with human values (Anglim et al., 2017). In close relationships, Lee et al. (2009) found that the intraclass correlation for honesty-humility between friendship dyads are higher than those of other HEXACO traits, showing assortment on this factor.

But why should similarity in traits in general be related to relationship quality? An answer to this question was provided by Karney and Bradbury's (1995) Vulnerability-Stress-Adaptation model. According to this model, relationship quality depends on experiences and exchanges in a relationship, with relationship quality in turn shaping how partners adapt to resolve their issues. Without functioning adaptation, the impact of inevitable stressful events is worsened. Adaptation and stress are thereby in a bidirectional relationship: stress decreases the chances of successful adaptation, and successful adaptation decreases stress.

However, both adaptation and stress are affected by the enduring vulnerabilities brought into the relationship by the partners. Possessing maladaptive personality traits, or a maladaptive combination of them, might pose a vulnerability for the couple that can exacerbate the impact of negative events, create stressful events, or weaken the adaptative response of the couple. Possessing similar traits might aid adaptation and decrease stress by increasing understanding of the partner's response, facilitating empathy. Traits have also been related to how individuals experience affective states (i.e., extraversion and pleasant affect; Lucas et al., 2000; Lucas & Diener, 2001; or neuroticism and negative affect; Eisenberger et al., 2005; Zautra et al., 2005). Being in a situation with someone who mirrors and validates one's emotions facilitates adaptive stress responses to the situation (Townsend et al., 2014).

Associations between Actual Trait Similarity and Relationship Quality

Contrary to the rather limited number of investigations into value similarity and relationship quality, a greater number of studies has examined the associations between trait similarity and relationship quality. To summarise the evolution of this vast field of study, I categorise its history into five periods, each representing large shifts in the measurement of personality, the focus and aims of research, operationalisation of similarity, and the method of analysis. Table 2 shows the studies that have been conducted in each period.

The first of these epochs is an early age where methods varied wildly between different studies. The big-five framework had yet to receive sufficient empirical support for

widespread adoption. Consequently, personality assessment involved other inventories such as the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1951) or Q-sort procedures, where participants sorted adjectives according to whether they describe themselves or their partner. This early age can also be characterised by the small sample sizes used in most investigations. The go-to method of operationalising similarity (with a few exceptions) was the difference score, with most studies simply computing difference scores (or profile difference scores; i.e., the sum of all difference scores) and correlating them with various outcomes. All studies in this period split their samples by gender when analysing similarity effects, which was highlighted as being problematic by later researchers (e.g., Dyrenforth et al., 2010; Luo et al., 2008). Notwithstanding these methodological limitations, the early studies nearly unanimously indicated a positive association between trait similarity and relationship quality (Dymond, 1954), sometimes with exceptionally large effects (r = .75; Corsini, 1956; but see Murstein & Beck, 1972, for an exception)

The second period of research converged towards using a narrower range of personality measures, as the majority of studies investigated the effect of similarity in traits covered by the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975). Although smaller samples led to many analyses being underpowered (Glicksohn & Golan, 2001; Lewak et al., 1985; Russell & Wells, 1991), the samples employed by some studies were large enough to detect small effects (Eysenck & Wakefield, 1981; Robins et al., 2000). The research questions also took a more complex shape, as researchers wondered about whether the nature of the sample (Lewak et al., 1985) or the method of operationalising similarity mattered (Russell & Wells, 1991). In general, studies from this period converged in support of a positive effect of similarity in neuroticism and psychoticism (Eysenck & Wakefield, 1981; Russell & Wells, 1991), or neuroticism-like traits in the MMPI (Lewak et al., 1985), or Multidimensional Personality Questionnaire (Robins et al., 2000). In this research period, only one small-sample study did not find any effect of trait similarity on relationship quality (Glicksohn & Golan, 2001).

The third period of research emerged with the popularisation of the Big Five framework (Costa & McCrae, 1992; Goldberg, 1990), leading to increased use of the NEO-Personality Inventory (NEO-PI; Costa & McCrae, 1992) and the Big-Five Inventory (BFI; Benet-Martínez & John, 1998). While still having methodological flaws, the quality of research increased because sample sizes below 100 couples were rare (see Bleske-Rechek et al., 2009; Gonzaga et al., 2007; Shiota & Levenson, 2007 as exceptions). In fact, this period saw the largest analysis of personality similarity and romantic relationship quality to date (Dyrenforth et al., 2010). There also was increased debate about the importance of the outcome measure, as studies began to arrive at different conclusions depending on the instrument used to measure relationship quality, even within the same sample

Table 2

Studies of actual trait similarity sorted by research period

Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
First Period					
Corsini (1956)	20 married couples	26-item General Satisfaction in Marriage questionnaire (Burgess & Cottell, 1939)	50-item self-constructed personality adjective Q-sort task	Pearson profile correlation	Positive association in general
Dymond (1954)	15 married couples	Single-item relative satisfaction	MMPI (Hathaway & McKinley, 1951)	Absolute difference score between binary responses	Positive association in general
Murstein and Beck (1972)	60 married couples	Marital Adjustment Scale (Locke & Wallace, 1959)	20-item bipolar adjective checklist (Norman, 1963)	Absolute difference score between binary responses	Positive association limited to men; No association in women
Second Period					
Eysenck and Wakefield (1981)	566 married couples	Marital Adjustment Scale (Locke & Wallace, 1959)	Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975)	Algebraic difference score and quadratic difference score in regression, controlling for actor and partner effects	Positive associations of similarity in neuroticism and psychoticism, explaining ~2% of variance

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Glicksohn and Golan (2001)	65 married couples	Single-item satisfaction measure	Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975)	r_{pa} (McCrae, 1993)	No associations
Robins et al. (2000)	360 college couples	Interview Questions	Multidimensional Personality Questionnaire (Tellegen, 1982)	Squared profile difference scores	All associations were small and positive (.11 < *r* < .18)
Russell and Wells's (1991)	95 married couples	14-item self-made Marriage Quality Questionnaire	Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975)	Squared difference score and interaction of actor and partner personality	Positive association of similarity in psychoticism and extraversion when using squared difference scores. Only one significant interaction in psychoticism

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Third Period					
Barelds (2005, Study 1)	690 mostly married couples	Dutch Relationship Questionnaire (Barelds & Lutejin, 2003)	Dutch Personality Questionnaire (Lutejin et al., 2000)	Euclidian distance (i.e., square root of difference between squared traits) controlling for actor and partner effects (partial correlations)	Positive association of similarity in rigidity (r = .10) and self-esteem (r = .15); no association of similarity in neuroticism, social anxiety, hostility, egoism, or dominance
Barelds (2005, Study 2)	282 mostly married couples	Dutch Relationship Questionnaire (Barelds & Lutejin, 2003)	Five-Factor Personality Inventory (Hendriks et al., 1999)	Euclidian distance (i.e., square root of difference between squared traits) controlling for actor and partner effects (partial correlations)	Only a small, positive association of similarity in agreeableness (r = .14)

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Barelds and Barelds-Dijkstra (2007)	137 married couples	Dutch Relationship Questionnaire (Barelds & Lutejin, 2003), and Sternberg's (1997) measure of triangular love, assessing intimacy, passion, and commitment	Five-Factor Personality Inventory (Hendriks et al., 1999)	Absolute difference score controlling for actor and partner effects	Negative association of similarity in agreeableness with relationship passion and commitment, but no association with overall relationship quality or intimacy. Positive association of similarity in neuroticism with overall relationship quality, but no association with other relationship outcomes
Bleske-Rechek et al. (2009)	51 college couples	Self-designed five-item commitment scale	Big-Five Inventory (Benet-Martínez & John, 1998)	Pearson profile correlations for each trait dimension	No associations apart from one small positive association of similarity in extraversion (r = .29)

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Dyrenforth et al. (2010)	2639 Australian couples and 3277 UK couples	Single-item measure of relationship (Australia) or partner (UK) satisfaction	An adjective measure of personality in the Australian sample (Saucier, 1994), the Big Five Inventory (Benet-Martínez & John, 1998) in the British sample	Pearson profile correlations and absolute difference scores in structural equation actor-partner independence models	Positive association of similarity in extraversion and openness in the Australian sample, and a negative association of similarity in neuroticism in the British sample
Gattis et al. (2004)	48 non-distressed couples and 132 distressed couples	Sum of Dyadic Adjustment Scale (Spanier, 1976) and Marital Adjustment Test (Locke & Wallace, 1959)	NEO Personality Inventory (Costa & McCrae, 1992)	Absolute difference score, controlling for actor and partner effects	No associations
Gonzaga et al. (2007)	66 dating couples (Study 1); 172 married couples (Study 2)	Marital Adjustment Test (Locke & Wallace, 1959) with added items (both studies)	Big-Five Inventory (Benet-Martínez & John, 1998; Study 1); NEO Inventory (McCrae & Costa, 1987)	Pearson profile correlation	Positive association of trait profile similarity in both studies

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Luo et al. (2008)	537 general population couples	Enriching Relationship Issues, Communication, and Happiness scale (Fowers & Olson, 1993)	Chinese Personality Assessment Inventory (Cheung et al., 1996)	Pearson profile correlations and absolute difference scores in structural equation actor-partner independence models	All positive associations of trait similarity when operationalised as profile correlations; only one positive association of trait similarity when operationalised as difference scores (in social potency)
Luo and Klohnen (2005)	291 married couples	Sum of Marital Adjustment Test (Locke & Wallace, 1959), Relationship Assessment Scale (Hendrick, 1988); five items on disagreement frequencies in self-report. Answers to interview questions rated by strangers	Big-Five Inventory (Benet-Martínez & John, 1998)	Pearson profile correlation corrected for stereotypically and absolute profile difference scores	Positive associations of trait similarity with relationship quality self-report; only positive associations with profile correlations when predicting other-rated relationship quality, not with difference scores.

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Nemechek and Olson (1999)	99 married couples	Dyadic Adjustment Scale (Spanier, 1976)	NEO Personality Inventory (Costa & McCrae, 1992)	Algebraic difference score and quadratic difference score in regression	Positive association of similarity in neuroticism agreeableness, and conscientiousness when operationalised as quadratic difference scores
Neyer and Voigt (2004)	100 college couples	Relationship Assessment Scale (Hendrick, 1988)	NEO Personality Inventory (Costa & McCrae, 1992)	Absolute difference score controlling for actor and partner effects	No associations
Shiota and Levenson (2007)	82 middle-aged couples and 74 older couples in longitudinal analysis	Sum of the Marital Adjustment Test (Locke & Wallace, 1959) and Marital Relationship Inventory (Burgess et al., 1971)	Adjective Check List (Gough & Heilbrun, 1980)	Absolute difference scores for individual traits and absolute profile difference scores	No associations of similarity with overall relationship quality. Similarity in extraversion negatively predicted the trajectory of relationship quality in the middle-aged sample
D. Watson et al. (2004)	291 married couples	Marital Adjustment Test (Locke & Wallace, 1959)	Big-Five Inventory (Benet-Martínez & John, 1998)	Absolute difference score controlling for actor and partner effects	Only positive associations of similarity in conscientiousness and openness, but only in men

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Fourth Period					
Decuyper et al. (2012)	191 couples from the general population	Relationship Assessment Scale (Hendrick, 1988)	NEO Personality Inventory (Costa & McCrae, 1992)	Sum of differences between squared personality variables and r_{pa} profile correlation (McCrae, 1993)	Only positive associations of profile similarity in women, not in men; regardless of how similarity was operationalised
Gray and Coons (2017)	125 college couples	Relationship Assessment Scale (Hendrick, 1988)	Big Five Inventory 2 (Soto & John, 2017)	Pearson profile correlation and absolute profile difference score	No associations
Humbad et al. (2013)	1643 married couples	Dyadic Adjustment Scale (Spanier, 1976)	Multidimensional Personality Questionnaire (Tellegen, 1982)	Pearson profile correlation (raw and corrected for normativeness)	Only raw profile correlations showed a positive association of profile similarity
Solomon and Jackson (2014)	4103 couples in four-year longitudinal study	Single-item measure of relationship quality	An adjective measure of personality (Saucier, 1994)	Actor x Partner interaction in a multilevel model	No associations; Neither cross-sectionally nor longitudinally

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Similarity	Associations between Trait Similarity and Relationship Quality
Tidwell et al. (2013)	187 speed-daters	Four-item self-made measure of romantic liking	International Personality Item Pool Five-Factor Model Measure (Donnellan et al., 2006) and 14 self-characteristics (e.g. “friendly, “dependable”)	Actor Partner Independence multilevel model with random intercept and the (inverted) absolute difference between traits	Negative associations of similarity in the self-characteristics “dependable/trustworthy” and “friendly/nice”; No other associations
Zhou et al. (2017)	281 general population couples	Perceived Relationship Quality Component questionnaire (Fletcher et al., 2000b)	International Personality Item Pool Five-Factor Model (Donnellan et al., 2006)	Pearson profile correlations and absolute difference scores in structural equation actor-partner independence models	Negative associations of similarity in openness, independently of operationalisation of similarity. No other associations
Fifth Period					
Leikas et al. (2018)	312 parents(-to-be)	Self-made Single-Item Relationship Happiness Measure	eXtra short Five Questionnaire (Konstabel et al., 2017)	Polynomial Regression and Response Surface Analysis	Additive effect of agreeableness and actor x partner interactions in neuroticism. No further dyadic effects
Weidmann et al. (2017)	237 mostly married couples	Relationship Assessment Scale (Hendrick, 1988)	Big-Five Inventory (Rammstedt & John, 2005)	Polynomial Regression and Response Surface Analysis	Complementarity effects in neuroticism and openness, but none of them are (true) similarity effects

Note. MMPI = Minnesota Multiphasic Personality Inventory

(Barelds & Barelds-Dijkstra, 2007). At the same time, studies in this period tended to find positive associations of similarity with relationship quality, when operationalising similarity using profile correlations (Dyrenforth et al., 2010; Gonzaga et al., 2007; Luo et al., 2008; Luo & Klohnen, 2005), while studies that used some sort of (profile) difference scores mostly failed to find (robust and non-gender specific) trait similarity effects (Barelds, 2005; Gattis et al., 2004; Neyer & Voigt, 2004; D. Watson et al., 2004). Some studies were exceptions to this pattern and obtained positive associations between similarity and relationship quality, regardless of the method used to operationalise similarity (Dyrenforth et al., 2010; Luo et al., 2008; Luo & Klohnen, 2005; Nemechek & Olson, 1999). Other studies even found negative associations between similarity and relationship quality (Shiota & Levenson, 2007), delivering evidence for a positive role of trait complementarity.

Towards the end of this period, the prevalent practice of splitting samples by gender was called into question (Luo et al., 2008), and multilevel modelling and structural equation modelling were used as alternatives to control for the statistical interdependence between relationship partners (Dyrenforth et al., 2010; Luo et al., 2008). One of these studies was the aforementioned largest investigation into the effects of romantic partner trait similarity to date. Dyrenforth et al. (2010) used the actor-partner independence model (Cook & Kenny, 2005), with the addition of a variable indicating similarity (i.e., an absolute trait difference sore, an absolute profile difference score, or the intraclass profile correlation) to investigate big-five similarity in data from large household panels in Australia (n = 2639 couples) and the UK (n = 3277 couples), including married couples of similar age and relationship duration. Problematically, relationship quality in both samples was reported using a single-item measure of relationship (Australia) or partner (UK) satisfaction. Personality was assessed by an adjective measure of the big-five personality traits (Saucier, 1994) in the Australian sample and the Big-Five Inventory (BFI; Rammstedt & John, 2005) in the British sample. Interestingly, associations between similarity and relationship quality did not replicate between the national samples. For example, similarity in extraversion and openness was beneficial for relationship quality in the Australian sample, while only similarity in neuroticism (negatively!) related to relationship quality in the British sample. The same issue emerged when similarity was measured across entire profiles. Both profile difference scores and ICCs were positively associated with relationship quality in the Australian sample, while these effects were not replicable in the British sample. Dyrenforth et al.'s (2010) investigation had the largest samples to date and the most appropriate statistical methods at the time, giving their finding that personality similarity effects are small and difficult to replicate extra weight.

As consensus started to shift towards believing that trait similarity was of lesser importance for relationship quality, the field moved to the fourth phase. The focus of research in this period was on finding the ramifications of trait similarity effects (or the lack

thereof), potentially explaining the diverging findings of the past. Preserving the methodological advancements of previous periods, fourth-period samples were all comprised of more than 100 couples each and (mostly) used questionnaires measuring the big-five personality traits. Knowledge about the importance of the way in which similarity is operationalised was present in almost every study, and samples were now only very rarely split by gender (for an exception, see Decuyper et al., 2012).

Looking for mediators and conditions related to the appearance and disappearance of trait similarity effects, research more closely and rigorously investigated the impact of the operationalisation of similarity. Decuyper et al. (2012) and Humbad et al. (2013) showed renewed interest in the importance of how similarity was operationalised. First, Decuyper et al. (2012) compared the effects of similarity when operationalised as the sum of (squared) differences, forming a profile difference score, with the effects of similarity when operationalised as profile correlations (using r_{pa}; McCrae, 2008). However, whenever the researchers found actual similarity to matter for relationship quality, it mattered regardless of whether difference scores or r_{pa} were used to operationalise similarity. Second, Humbad et al. (2013) re-examined the use of profile correlations for similarity research. Specifically, their issue was with the degree to which the positive effect of profile correlations (e.g., Gonzaga et al., 2007) might have been inflated by normative responding. To show the impact of normativeness, the researchers conducted three analyses, one with Pearson correlations between raw scores, one with Pearson correlations between mean-centred scores, and one with Pearson correlations between fully standardised variables. Their results showed that profile correlations were not associated with relationship quality after controlling for normativeness (through centred or standardized scores). Thus, while past (e.g., third-period) studies provided evidence in favour of using profile correlations rather than difference scores, Humbad et al.'s (2013) results show that special precaution should also be taken in interpreting results derived from profile correlations.

Research in this period also considered the nature of the samples used to analyse similarity effects. Tidwell et al. (2013) collected a sample of the newest relationships to date: a sample of 187 speed-daters. Interestingly, absolute big-five trait similarity between speed-dating partners were not related to relationship quality. However, the researchers found some negative associations of similarity in the two self-characteristics of being “dependable/trustworthy” “friendly/nice” with relationship quality. While Tidwell et al. (2013) interpreted these effects as a chance finding, their presence hints at the possibility that similarity in certain, relatively unobserved traits matters for relationship quality, at least in newer couples.

Hudson and Fraley (2014), on the other hand, started looking at different sample characteristics through measures of attachment anxiety felt by romantically involved

individuals. They theorised that individuals high in attachment anxiety might have more need for similarity because it contributes to a stable relationship. Accordingly, their prediction was that the similarity effects would be stronger in low-attachment individuals. While they did not find associations between personality similarity and relationship quality (no matter the operationalisation of similarity), they found a significant interaction with attachment. The similarity effects were weakest for securely attached individuals. Therefore, similarity mattered to a different extent depending on the level of attachment.

Lastly, Zhou et al. (2017) tested whether Dyrenforth et al.'s (2010) results from Australia and the UK replicated in a sample of Chinese couples. Zhou et al. (2017) also criticised the single-item outcome measures in Dyrenforth et al.'s (2010) participant panels, arguing that the multifaceted nature of relationship quality had been neglected. Replicating Dyrenforth et al.'s (2010) statistical method (while using culturally appropriate personality instruments) the researchers only found one significant effect, which emerged independent of the nature of operationalising similarity (i.e., difference score or profile correlation). Specifically, *dissimilarity* in openness predicted higher relationship quality. The authors interpreted this finding as an effect of role complementarity. From the differences between this study and (Dyrenforth et al., 2010), we can infer a combination of three explanatory factors. First, the stage of the relationship may moderate the similarity, as Zhou et al.'s (2017) sample consisted of young dating relationships while Dyrenforth et al.'s (2010) samples were long-running marriages. Second, the role of similarity may be sensitive to the cultural context of the sample. Third, the role of similarity may vary across the facets of relationship quality being examined, therefore requiring a broad measure of relationship quality to capture a conclusive picture.

In recent years, another paradigm shift has introduced polynomial regression for settling the dispute around the role of personality similarity in relationship quality. First, Weidmann et al. (2017) asked 237 mostly married, middle-aged Swiss couples to complete the Big Five Personality Inventory and the Relationship Assessment Scale (Hendrick, 1988). Weidmann et al. (2017) used these measures in the general polynomial model (Equation 7) while constructing structural equation path models for each gender (thus obtaining one response surface for men and one for women). Their findings showed no significant dyadic effects for any big-five traits cross-sectionally; however, when predicting relationship quality in two years (n = 141), a significant effect interaction for neuroticism emerged for male partners' relationship satisfaction, and a subsequent response surface analysis revealed that men were more satisfied when both themselves and their partners were either very high on neuroticism or very low on neuroticism. There also emerged a significant interaction and significant actor and partner quadratic effects for openness predicting female partners' judgements of relationship quality. As specified by a true similarity effect, the interaction

term was positive, and the quadratic terms were negative. However, the effects were roughly equal in magnitude (instead of the interaction being twice as large as the quadratic effects), leading to a response surface showing that female judgements of relationship quality were highest when both partners reported modest levels of openness. In those two cases, Weidmann et al. (2017) showed that the polynomial model produced a better fit than the actor partner interdependence model. Without a single shape resembling a true similarity effect, Weidmann et al. (2017) supported Dyrenforth et al.'s (2010) conclusion that personality similarity was not important for relationship quality.

Second, Leikas et al. (2018) examined dyadic effects in personality traits, but also political attitudes and human values in a sample of 312 Finnish parents or parents-to-be, whom were recruited at a child health clinic. The Big Five were measured using the eXtra short Five Questionnaire (XS5; Konstabel et al., 2017), and relationship quality was measured with a single-item assessment of relationship satisfaction. Polynomial regression models were used in structural equation modelling, and models with and without a gender split were compared. Results differed somewhat from the findings obtained by Weidmann et al. (2017). There was no significant interaction for men or women in neuroticism. While men's relationship satisfaction was dependent mostly on their own neuroticism (negatively), women's relationship satisfaction was lowest when both they themselves and their partners were high in neuroticism (i.e., an effect of additive negativity). There was an additive effect in agreeableness, with both partners' higher scores independently and roughly equally predicting more satisfaction. This effect was equal across genders. No further dyadic effects emerged for personality traits, leading the authors to conclude alongside previous research that similarity in personality traits was not important for relationship quality.

In sum, the literature review, while inconclusive at the beginning, draws toward a verdict against the importance of similarity in personality traits for relationship quality. Most of the positive effects of individual personality trait factors were obtained using difference scores without controlling for mean levels, or profile correlations, which are dubious when calculated within a specific factor (because of the redundancy of the items within a factor). More recent and more methodologically valid studies consistently fail to find effects of similarity in personality traits.

However, there are three important gaps left unaddressed. I have already addressed the problems of inconsistent instruments (especially single-item measures) to measure relationship quality, and the issue of neglecting younger relationships. Adding to the first point, we now see that neither study that employed polynomial regression used a multifaceted measure of relationship quality (the Relationship Assessment Scale in Weidmann et al., 2017 versus a single-item measure of satisfaction in Leikas et al., 2018). Adding to the second point, both modern polynomial regression analyses (Leikas et al.,

2018; Weidmann, Schönbrodt, et al., 2017) have looked at older, more advanced relationships.

Content and Standpoint in Traits and Values

Beyond the above methodological issues, it is also important that research has not considered the roles of value similarity and personality similarity simultaneously. This simultaneous examination would enhance understanding the role of each construct. In this thesis, my focus is on understanding the role of value similarity and therefore I focus here on the implications of the simultaneous comparison for understanding this role.

One benefit of this simultaneous comparison for understanding the role of value similarity is that some of the motivational content not assessed by (for example) value instruments might be present in trait models (Hanel & Maio, 2020). This possibility is made evident by recognising that, on one hand, value measures and trait measures present different item content, such as “tradition” (value) versus “extraversion” (trait). On the other hand, these measures also ask fundamentally different questions about that content. When human values are measured, participants are asked to rate the content’s importance as a guiding principle to their lives. In contrast, when personality traits are measured, participants are asked to rate the content as it describes their current behavioural tendencies. Thus, values and traits not only differ in content, but also in their subjective standpoint (i.e., being current dispositions, or abstract goals; Hanel & Maio, 2020). This difference can be illustrated by imagining tasks that ask people to rate the extent to which a value describes their behaviour (e.g., “I act in a way that promotes benevolence”, “I am benevolent”) and the importance of the trait (e.g., “being conscientious is important to me”).

The confounding nature of content and standpoint in personality research was pointed out by Hanel and Maio (2020). To see whether motivational content or subjective standpoint mattered for predicting affective and cognitive outcomes, they re-phrased SVS items to ask about traits (e.g., “I act in a way that promotes Achievement [success according to societal standards]”), and HEXACO trait items to ask about values (e.g., “Being conscientious is important to me as a guiding principle in my life”). In five empirical studies, the authors investigated the properties the rephrased scales. The first two studies showed that both value items and trait items retained their structure when recast in the other standpoint. This confirmation was obtained after subjecting values-as-traits to multidimensional scaling and traits-as-values to a factor analysis. A third study delivered high correlation between values and values-as-traits, and traits and traits-as-values. According to the researchers, this result confirms that transformation to the other standpoint conserves the meaning of the value or trait content. This third study also showed (using factor analysis and multidimensional scaling) that traditional value and trait scales tap

different motivational content. Lastly, a final set of two studies revealed that both measurement content and focus both matter. For instance, in a model with all values content (values and values-as-traits) with all trait content (traits with traits-as-values), both types of content independently predicted mindfulness. Also, in a model with all measures from a values standpoint (values with traits-as-values) and all measures from a traits standpoint (traits with values-as-traits), each measurement focus independently explained variance in mindfulness (Baer et al., 2008), some facets of need for affect, and need for cognition. Of further interest, follow-up analyses revealed that values-as-traits predicted variance in these constructs over and above variance explained by values. Similarly, traits-as-values explained additional variance over traits in several (more distant or cognitive) constructs such as moral identity (Aquino & Reed, 2002), Machiavellianism (Paulhus & Williams, 2002), and need for cognition (Cacioppo & Petty, 1982). Thus, these alternative measures improved the quality of prediction by shifting the measurement focus to better encompass the conceptual connection between the latent content and relevant outcomes.

Lastly, existing value or trait questionnaires often ask questions that are unclear about the standpoint from which the motivational content is to be evaluated. One example of such a value measure would be the PVQ5X scale (Schwartz et al., 2012), where several items could have been construed as measuring traits (e.g., item BED2: “She/He goes out of her/his way to be a trustworthy friend”, item ST1: “She/He takes advantage of every opportunity to have fun”). Recognising this shortcoming, a revised version (PVQ-R) was developed, in which each item was reworded to start with the phrase “it is important to her/him” (Schwartz & Butenko, 2014). However, items with ambiguous standpoints are still found in recent trait measures, like the XS5 (e.g., item 7: "I have quite traditional values.", item 14 "I am a reliable person, who values ethical principles."; Konstabel et al., 2017), which was used by Leikas et al. (2018). The presence of items with ambiguous standpoints makes it difficult to attribute congruence effects to either matching behaviours or goals, impairing the development of theory on the precise dimension of personality in which congruence matters for relationship quality.

In sum, recasting values and traits in terms of content and standpoint creates meaningful new combinations for the assessment of individual differences. In the context of the role of value similarity, this expanded perspective is useful for (re)discovering psychological content in which dyadic fit is of importance. In fact, some of this new and important content might have already been found by studies such as Tidwell et al. (2013), who found no similarity effects with big-five agreeableness traits, but with the (trait-like) self-characteristics of being “dependable/trustworthy” and “friendly/nice”, which are more similar in content to benevolence as assessed by the SVS (Schwartz, 1992). Further, important theoretical assumptions are that effects of implicitly agreeing on an abstract ideal might help

because sharing common goals facilitates the creation of a shared identity (Agnew et al., 1998) and makes goal pursuit more efficient (Fitzsimons et al., 2015), while similarity in personal dispositions are due to behaving in similar ways and creating a common understanding of emotions (Anderson et al., 2003; Gonzaga et al., 2007). Both of these assumptions might apply to values and traits if the standpoint of measurement is adapted accordingly. However, without disentangling content and standpoint, research will not be able to tell whether any congruence effect is due to partners striving towards compatible goals or actually behaving in a compatible way. As this disentanglement is not possible using existing scales which often involve items which are ambiguous as to whether they actually measure goals or behaviours, using the values-as-traits and traits-as-values methods (Hanel & Maio, 2020) will be necessary to answer questions regarding the relative importance of goal or behavioural congruencies for relationship functioning.

How This Thesis Addresses Actual Similarity

While modern evidence with rigorous statistical methodology generally points towards no or only small effects of value and trait similarity on relationship quality, some methodological limitations remain. Recent studies investigating human values and traits have both used older, more committed samples (Leikas et al., 2018; Weidmann, Schönbrodt, et al., 2017), and relationship quality was not assessed with a validated multifaceted measure. Research on values specifically is scarce, no analysis has looked at the higher-order value types, and only one analysis has used the SVS (Gaunt, 2006) which might influence the results (Roccas et al., 2017). Further, no study has investigated whether the roles of value and trait similarity are interrelated, or if differences arise due to motivational content or standpoint in the measures of these constructs. Lastly, the literature review makes clear that there is a lack of replication of specific congruence effects (rather than effects of profile similarity). Few papers report attempts to replicate their findings in different samples drawn from similar populations, and the few attempts to do so have mostly failed to replicate their findings (e.g., Dyrenforth et al., 2010).

To address these gaps, I will re-examine the role of value similarity in romantic relationships by including a simultaneous analysis of the role of trait similarity. My approach will utilise the new method of also assessing values as traits and traits as values (Hanel & Maio, 2020). Furthermore, I will conduct polynomial regression analysis, and with the help of response surface analysis, I will investigate hypotheses stating that personality similarity (including in the higher-order value types) is related to increases in relationship quality as measured by an established, multi-facetted instrument. In addition, based on a lack of evidence in newer couples and the prior theory and evidence suggesting a role for similarity in such couples, the tests will be performed in a new sample of young student couples. I will subject any significant effects that I find to replication to ensure that my findings are robust

and generalisable to the population from which they are drawn (young college relationships). This research is therefore the first to combine well-established theories of values and traits in investigating similarity using polynomial regression in a sample of newer relationships.

Perceived Similarity

A separate, but related issue regards the effects of perceiving a partner to be psychologically similar, as noted at the start of this introductory chapter. The following section will focus on perceived similarity and how it relates to relationship quality. I will highlight how, despite the long history of research, no study has directly compared perceived similarity in human values and personality traits in terms of their predictive power. I will also introduce the importance of relationship ideals in this context, identify the meaning of these ideals in the literature, and discuss a lack of clarity regarding the dominant causal direction between perceived similarity and relationship quality. I will note that latter issue is connected to the lack of a precise mechanism for linking the two, while also describing a mechanism through which perceived similarity in human values and relationship ideals may matter more than in personality traits. Specifically, this thesis will outline a new theoretical framework explaining how perceived similairty causes relationship quality (bottom-up), by integrating theoretical accounts of the information integration perspective (Ajzen, 1974; M. F. Kaplan & Anderson, 1973) and transactive goal dynamics (Fitzsimons et al., 2015). Accordingly this thesis will aim to address the following three questions in regards to perceived similarity:

- In which personality dimension is perceived similarity most important for predicting relationship quality?
- What is the dominant causal direction between perceived similarity and relationship quality?
- What is the causal mechanism between perceived similarity in and relationship quality?

The Operationalisation of Perceived Similarity

Before addressing the three questions above, I will explain methodological decisions I have made when operationalising perceived similarity, and describe my causal framework in more detail. Methodologically, I will not be using polynomial regression for the investigation of perceived similarity. Instead, I will use simple, overall assessments of similarity by one person. Partially, I made this choice because direct similarity assessments save time compared to long personality questionnaires, thus keeping data quality high and drop-out at a minimum (Galesic & Bosnjak, 2009). Additionally, polynomial regression only makes sense for comparisons of specific dimensions with somewhat homogenous content (J. R. Edwards, 2002). Because my perceived similarity hypotheses target overall dimensions of similarity (rather than individual traits), and because it is impossible to use polynomial

regression with overall profile similarity indices, these techniques are unsuitable for my investigations of perceived similarity effects.

I will also not use profile correlations or profile difference scores. Not only is data collection for these methods significantly more time intensive (from the participants' point of view), they also each have issues associated with them. The problems with profile correlations have been elaborated in a prior section (e.g., confounding shape and elevation similarity). Likewise, by definition, profile difference scores assume that perceived similarity on all dimensions contributes equally to the overall perception of trait and value differnece. Because there is no evidence that this is how overall perceptions of similarity are constructed, we sought a more direct approach and inquire directly about perceptions of trait, value, and relationship ideal similarity with the partner. This approach is similar to creating a measure of profile similarity, but having it being created by the participant.

It should be noted that Edwards (2001) criticised the use of such direct comparison ratings, because they merely moved the task of creating the difference score from the researcher to the participant. Further, he pointed out the possibility that direct comparison items might involve processes unrelated to the rational combination of scores produced by difference scores, therefore making comparison of findings obtained by the two techniques difficult. It is not obvious that the participant will assign each item the same weight when estimating profile similarity.

However, I argue that this might also constitute an advantage possessed by direct similarity ratings, because the participant is free to weight the similarities more strongly if they find them ideographically important (within given boundaries, i.e., that similarities must be about traits). These participant subjectivities do not invalidate Edwards's (2001) criticism about the difficulty comparing mental estimates of similarity with more rational difference estimations. Such overall similarity ratings might indeed measure a different construct than profile difference scores. I merely argue that it is an empirical question whether participants' self-constructed perceptions of similarity are better or worse indicators of the pivotal latent mental processes within partners in everyday life than the analyses of between-partner similarities constructed by researchers.

A Goal-Support Information Processing Framework of Perceived Partner Similarity

To explain why the importance of perceived similarities for relationship quality differs as a function of the dimension of perceived similarity, my framework contends that perceived similarity in different dimensions varies in the extent to which it signals common goals. A similar claim has been made previously by the information processing perspective (Ajzen, 1974; M. F. Kaplan & Anderson, 1973), which predicts that perceived similarity is important to the extent that it manages to convey positive information about the target. The information

processing perspective emerged as a response to the earlier reinforcement model (Byrne et al., 1971; Byrne & Nelson, 1965), which takes a classical conditioning approach to explaining why perceived similarity affects relationship quality. According to the reinforcement model, the fact that similarity is perceived functions as an unconditioned stimulus, eliciting an implicit affective response, which is then conditioned to the partner as the conditioned stimulus.

However, Kaplan and Anderson (1973) pointed out several problems with this view. If the theory construes perceiving similarity as an unconditioned stimulus eliciting an affective response, it is difficult for the theory to account for different findings for different dimensions of personality. The information processing model, on the other hand, states that information about another person lets the observer infer other information about the object. For example, seeing a partner as smart, might also let us see the person as creative, and seeing the partner as funny, might also let us see the person as likable. Thus, it is not similarity itself that leads to positive evaluations of the partner and relationship, but the information inferred from similar dispositions.

To this end, an important study by Ajzen (1974) showed that the effect of similarity in a personality trait was mainly attributable to whether the trait was seen as desirable or not. Perceiving someone to have desirable traits, irrespective of whether the participant possessed those traits themselves, was related to attraction. To show this effect, similarity in certain aspects of personalities and opinions was manipulated in a bogus stranger paradigm, wherein participants are shown a completed questionnaire filled in by another (ficticious) participant. Similarity and desirablity are manipulated by the experimenter after the participant has completed their questionnaire. Using the participants' answers, scores for the stranger are created based on fixed rules for the different conditions, such that the profile is either more similar irregardless of desirability or desirable irregardless of similarity. The results showed that similarity did not contribute positively to the evaluation of a stranger when it was observed in an undesirable trait.

In line with this evidence, Montoya and Horton (2004) tested whether similarity was as important as it conveyed positive information. Their experiments had participants receive information about a bogus partner's attitudes and were asked to evaluate the partner with regards to several dispositions (i.e., "The person is probably good at everything that s/he does."). Crucially, the effect of manipulated attitude similarity was fully mediated by positive evaluations of the person. A second study in the same article let participants freely generate information about the bogus partner after learning about the bogus partner's attitudes. The more similar the bogus partner's attitudes were described to be to their own, the more positively valenced information participants listed, which also lead to more positive positive evaluation of the bogus partner, and consequently to more liking.

An even stronger test of the information-processing account was given by Montoya and Horton (2013), who compared the predictions of the reinforcement model and the information processing perspective in a meta-analysis of 240 studies. Central to their analysis was the different effect sizes for perceived similarity in attitudes, compared to personality traits, as attitudes were seen as more informative about the individual than personality traits. This effect was significant when attitudes were central to participants' self-concept, but not when attitudes were peripheral to the participants' self-concept. Accordingly, the researchers concluded that central attitudes were more informative about the other person, thus producing a larger effect when similarity was perceived on them.

More recently, Montoya and Horton (2014) presented a two-dimensional model of interpersonal attraction, which states that two specific evaluations determine the level of attraction. These evaluations are derived from information received about the other person and from perceived similarity among other things. The first of these evaluations is about the capacity of the other person to facilitate the individual's goals. Perceiving similarity in certain dimensions (e.g., a similar vocational background) might signal the *capacity* to help with certain active (e.g., work-related) goals. The second evaluation is about the *willingness* of the other to help with those goal pursuits. In their model, Montoya and Horton (2014) postulate that perceived similarity can signal both the competence and willingess to be helpful, the former because similarity can produce positive information about the target, and the latter because individuals expect a similar other to like them more than a dissimilar other would, and thus be more willing to help.

However, it is unclear from the literature which positive information should be inferred from perceived similarity. Although Montoya and Horton (2014) focused on information about competence and willingness to facilitate goal pursuits, which positive information facilitates perceptions of competence and willingness is not explicitly mentioned by their model. Further, there is no mechanism in the two-dimensional model which explains how perceived competence and willigness translate into improvements in relationship maintainance and relationship quality (rather than attraction). Both of these gaps can be addressed by incorporating the insights of transactive goal dynamics.

I have already introduced the theory of transactive goal dynamics (Fitzsimons et al., 2015) somewhat at various points of prior sections. The theory construes a couple as a single unit with two co-dependent subunits pursuing goals with and for each other. In this context, goals are desirable end states, available in a person's memory with associated means of attainment (Fishbach & Ferguson, 2007). The purpose of this single unit is to enhance the effectiveness of goal pursuits for the individuals involved in the relationship. To describe how this process impacts relationship quality, I have previously introduced the transactive goal dynamics terms of transactive density and goal coordination. Transactive

density is the extent to which partners' goal pursuits are interdependent, while goal coordination is the degree to which goals "fit". Accroding to transactive goal dynamics theory, the more transactive density there is an a relationship, the more important goal coordination becomes.

A final important term in transactive goal dynamics is transactive gain. It relates to the experience of goal pursuit being more effective with the partner than otherwise (with someone else or alone). Transactive gain thus contrasts with the experience of transactive loss, where the partner is relevant for multiple goal pursuits (i.e., transactive density is high) but goal coordination is poor. I opperationalise the experience of transactive gain in this thesis as perceived goal support, which is the experience that a partner actively contributes to the attainment of a goal. Supporting the predictions of transactive goal dynamics, perceiving goal support in a varitey of different goals has been connected to relationship quality (Brunstein et al., 1996; Emery et al., 2018; Gere et al., 2011; Hofmann et al., 2015; M. Kaplan & Maddux, 2002; Koestner et al., 2012; Molden et al., 2009).

Integrating both models, I propose that perceived similarity is only important to the extent that it delivers information about perceived similarity in goals. Perceived similarity in goals can enhance goal coordination. For example, perceiving a close other who holds a similar goal can signal commitment to that goal (Fishbach et al., 2011), which is important in early stages of goal pursuit (Koo & Fishbach, 2008), similar to the concept of implicit coordination (Shteynberg & Galinsky, 2011). However, as stated above, having similar goals does not always lead to goal coordination. In fact, shared-target and shared-outcome goals should be most effective. A special case of such goals can be found in relationship goals. These goals are special because they can only be reached through mutual collaboration from the partners. Examples include having a dream wedding, a passionate relationship, or wanting to become parents. For the attaiinment of these goals, perceiving common ground with the partner is not only beneficial, but necessary to perceive support. Consequently, similarity in those dimensions should be more important for successful coordination and partner support.

Past research has shown that perceiving similarity in relationship goals relates to perceptions of partner goal support, which in turn relates to relationship quality (Avivi et al., 2009; Muraru et al., 2017; Preotu & Turliuc, 2013). However, it has not yet been shown whether or not this pattern also emerges for other, more personal goals. Personal goals are not necessarily shared and similarity might be less beneficial for goal support. Accordingly, the model would predict that similarity in dimensions that do not signal goal similarity are not informative about goal support, and thus less important for relationship quality. That is, perceived similarities in dimensions that signal shared relationship goals should be more

important than similarities in dimensions which signal shared personal goals, if similarity is indeed more important for relationship goal support than for personal goal support.

Relationship Ideals

Like human values, relationship ideals are abstract goals (Fletcher et al., 1999), thus they are potentially informative about the partner's more concrete goals. I have already described in a section above how human values influence multiple goals by imbuing goal-related outcomes with valence (Feather, 1995), influencing even large goals such as migrating to another country (Goodwin et al., 2012), the choice of university subject or career paths (Bardi et al., 2014). Human values elicit goals, as someone who values demonstrating achievement will choose an achievement related goal because it lets them achieve (Parks & Guay, 2012).

This goal-elicitation also occurs for relationship ideals, which represent principles an individual believes to be important for a thriving relationship (e.g., passion, having fun, sharing interests) and that guide an individual's behaviour in the relationship context (Fletcher & Simpson, 2000; Muraru et al., 2017). While human values are more general and linked to a wide range of goals, relationship ideals are more concrete and specific to the relationship context (Fletcher et al., 1999). People strive to bring their relationship in line with their ideal perception of what a thriving romantic relationship should be like (Murray et al., 1996a; Rodriguez et al., 2015). If someone then idealises relationships that are characterised by passion and intimacy, the person will actively try to make her or his own relationship more intimate and passionate, which they can do by being more intimate and passionate themselves (Fowers & Owenz, 2010). Therefore, relationship ideals should be very informative about relationship goals.

Unlike values and relationship ideals, personality traits do not have goal character. Traits are therefore less informative about the partner's goals. In fact, individuals seem to choose certain goals because they believe their traits to represent means for goal attainment, rather than because the trait represents the goal. For example, Roberts et al. (2004) showed that adolescents high in extraversion or conscientiousness were more likely to later seek economic goals (e.g., having a high-status career), while individuals high in agreeableness are more likely to choose social goals (e.g., working to promote the welfare of others). If an economic goal demands high levels of extraversion, individuals may want to pursue this goal if they perceive themselves to possess this required disposition. However, it is unlikely that extraverts pursue the economic goal because it lets them be extraverted. Accordingly, it might be hard for others to infer any kind of goal similarity from personality similarity.

Past Evidence of Perceived Similarity in Different Dimensions

The evidence for the effect of perceived similarity in dimensions such as human values and relationship ideals is consistent with the notion that these goal-informative dimensions are more important for relationship quality. For values, Murray et al. (2002) showed that people unconsciously assimilate the perception of their partner to their perception of themselves. They calculated intraclass profile correlations between 18-values taken from the Rokeach Value Survey or the SVS of 105 married and 86 dating couples. . Murray et al. (2002) were particularly interested in the part of perceived similarity that is not related to actual similarity, which they called egocentrism. They computed this score by creating partial profile correlations between self and partner-ratings, controlling for the partner's self-ratings. Using structural equation modelling, perceived similarity was shown to significantly predict global relationship perceptions independent of actual similarity. This study had thus shown that perceived similarity predicted relationship quality independent of actual similarity.

Only two other studies investigated the association between perceived value similarity and relationship quality. First, Hebb (2005) researched the roles of actual and perceived value similarity in relationship quality. Respondents in same sex friendships or in romantic couples ranked the values of the Rokeach Value Survey (Rokeach, 1973), and ranked correlation coefficients were computed between partners' rankings to represent similarity. Relationship quality was assessed with the Relationship Assessment Scale (Hendrick, 1988). While perceived value similarity was correlated with relationship quality, this association was stronger for same sex friendship dyads than for romantic relationships. However, the limited number of romantic couples (n = 39) and the less precise methodology of value ranking might have skewed this result.

Second, Wu (2010) examined perceived similarity between romantic partners in a large sample of 268 American students and 237 Taiwanese students. All students completed (among other measures) the SSVS to measure values (Lindeman & Verkasalo, 2005), and the Investment Model Scale to measure relationship quality (Rusbult et al., 1998). Perceived similarity in values was operationalised by computing the intraclass correlation of self- and partner-perception. Perceived value similarity was significantly correlated with relationship quality in both the American and the Taiwanese sample. These results thus provide evidence for the cross-cultural validity of the association of perceived similarity between partners with their relationship quality.

Similar to human values, only three studies have looked into the effect of perceived similarity in relationship ideals or goals on relationship quality. Avivi et al. (2009) asked participants in two samples (n = 245, n = 156) to ideographically report important goals

related to their romantic relationships. For each goal, participants also rated how important this goal was for their partner (indicating similarity) and how much collaboration in working towards the goal comes from their partner. These two measurements were used to predict relationship quality as assessed by the PRQC (Fletcher et al., 2000b). Findings in both samples affirmed that perceived similarity in relationship goals was associated with goal progress (or collaboration), which in turn was associated with increases in relationship quality. Despite a large effect size for the association between goal similarity and relationship quality, this association was fully mediated by goal collaboration. There was no direct effect of perceived goal similarity beyond its shared variance with perceived goal support, thus showing the importance of sharing relationship goals for goal coordination.

Preotu and Turliuc (2013) asked 100 engaged and newlywed couples to report their partner and relationship ideals using Fletcher et al.'s (1999) scale. Participants were asked to directly assess how similar their partner's importance rating would be to their own importance rating for each ideal. The average of these scores produced the profile similarity score. For each ideal, partners were also asked about how much they talk about the ideal. Relationship satisfaction was measured by the Dyadic Adjustment Scale (Spanier, 1976). Similar to Avivi et al. (2009), perceived similarity in partner and relationship ideals had a strong connection to relationship quality, which was fully mediated by the effect of communicating about the ideals. Importantly, communication about the ideal can be seen as a kind of goal support (Morrison & Weldon, 1990).

Muraru et al. (2017) further illustrated this connection between perceived similarity and communication as a form of goal support. These scientists constructed a complex multiple mediation model, in which perceived similarity in relationship ideals leads to communication about these ideals, which leads to uncovering ideal-actual discrepancies, which then leads to correctional responses, which ultimately predict relationship quality. Again, Fletcher et al.'s (1999) ideals were presented to a sample of 153 couples for ratings of how similar individuals perceive their partner's responses to each item, and how much they communicate about it. Participants also rated each ideal in terms of importance and in terms of descriptiveness of the current relationship. The absolute difference between importance and descriptiveness constituted the perceived discrepancy score. Lastly, the amount of coping in response to perceived ideal discrepancies was measured on a scale constructed by Alexander (2008). The results of their analysis not only showed that the specified mediation model was significant, but also that perceived similarity in relationship ideals was more important than perceived similarity in partner ideals, corroborating the idea that perceived similarity in relationship goals is more important than similarity in personal partner goals.

While previous research (Table 3) has more frequently examined perceived trait similarity, the associations between this variable and relationship quality are more inconsistent than the associations seen for human values or relationship ideals. This inconsistency is in line with the less goal-informative character of personality traits. For instance, several early studies with a variety of methods fail to find any effect of perceived trait similarity at all (Amodio & Showers, 2005; Dymond, 1954; Middleton, 1993), while other only find small positive effects (Furler et al., 2014; Luo & Snider, 2009; Morry et al., 2011).

Of course, there is also some evidence in favour of the importance of perceived trait similarity for relationship quality. Murstein and Beck (1972) found (in a rather small sample of 60 married couples) that perceived trait similarity was significantly and positively correlated with marital adjustment for both men and women. Murray et al. (2002) found that egocentric perceptions of similarity in traits also significantly predicted relationship quality, similar to what the authors had observed for perceived value similarity (described above). Lutz-Zois et al. (2006) obtained a positive similarity effect by letting 247 participants (the largest sample so far) directly estimate similarity between their own and their partner's traits, using one perceived similarity item per trait. Using this method, perceived similarity in traits was significantly related to relationship quality.

Studies with positive results have also shown the limitations of the effect of perceived trait similarity. For example, in addition to their research on perceived value similarity, Wu (2010) looked at cultural differences in the importance of perceived trait similarity for relationship quality. However, contrary to the culture-independent effect found with perceived value similarity, the effect of perceived trait similarity predicted relationship quality occurred only in the US, but not in the Taiwanese sample. Decuyper et al. (2012) found in a rather large sample that percevied similarity was only associated with women's relationship quality, and that this result was dependent on the similarity metric used. Tidwell et al. (2013) found positive effects of perceived similarity in 7 out of 14 trait-like self-characteristics. They concluded that perceived similarity (in traits) might matter sometimes, but that it is not universally important. Lastly, Barranti et al. (2017) conducted the first (and to date only) investigation into effects of percevied similarity in the big five on relationship quality using polynomial regression. The results revealed evidence for similarity effects in concienciousness and openness. However, neither where pure perceived similarity effects, with the cocientiousness effect having a rising ridge, where perceived similarity was more effective if the person perceived themselves as high in conscientousness. The openness effect was an interaction with both significant a_2 and a_4 surface parameters, indicating that

Table 3

Studies of perceived trait similarity sorted chronologically

Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Perceived Similarity	Associations between Perceived Similarity and Relationship Quality
Dymond (1954)	15 married couples	Single-item relative satisfaction	MMPI (Hathaway & McKinley, 1951)	Absolute profile difference score between self-rating and perceived partner-rating	No associations
Murstein and Beck (1972)	60 married couples	Marital Adjustment Test (Locke & Wallace, 1959)	20-item bipolar adjective checklist (Norman, 1963)	Absolute difference score between binary responses to self and partner rating	Positive association of perceived similarity for both men and women.
Middleton (1993)	79 student couples	Relationship Assessment Scale (Hendrick, 1988)	NEO Personality Inventory (Costa & McCrae, 1992)	Absolute profile difference score between self-rating and perceived partner-rating	No associations except one small association of similarity in neuroticism for women (but not for men)

Continued on the next page

Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Perceived Similarity	Associations between Perceived Similarity and Relationship Quality
Murray et al. (2002)	105 married and 86 dating couples	4-item global relationship quality scale	22-item Interpersonal Qualities Measure (Murray et al., 1996b)	Intraclass profile correlation while controlling for actual traits of the partner (i.e., “egocentrism”)	Positive association of perceived trait similarity
Amodio and Showers (2005)	76 college couples	13-item Romantic love Scale (Rubin, 1970)	Attribute Card-sorting Task (Showers, 1992)	Number of attributes sorted to describe both partners	No associations
Lutz-Zois et al. (2006)	247 college students	Dyadic Adjustment Scale (Spanier, 1976)	Partner similarity ratings for each facet of the Big-Five appearing in the NEO Personality Inventory (Costa & McCrae, 1992)	Sum of direct personality similarity ratings	Positive association of perceived trait similarity
Luo and Snider (2009)	288 newlywed couples	Sum of Marital Adjustment Test (Locke & Wallace, 1959), a sexual satisfaction scale (Pinney et al., 1987), and a relationship conflict measure	Big-Five Inventory (John & Srivastava, 1999)	Intraclass profile correlation while controlling for actual traits of the partner (i.e., “egocentrism”)	Small positive association of perceived trait similarity ($.10 < \beta < .13$)

Continued on the next page

Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Perceived Similarity	Associations between Perceived Similarity and Relationship Quality
Wu (2010)	268 American students and 237 Taiwanese students	Investment Model Scale (Rusbult et al., 1998)	Ten-Item Personality Inventory (Gosling et al., 2003)	Intraclass profile correlations	Positive association of perceived similarity in the American sample; No association of perceived similarity in the Taiwanese sample
Morry et al. (2011)	55 and 136 college students	Relationship Assessment Scale (Hendrick, 1988)	Lowly and moderately relationship relevant traits (Gill & Swann, 2004)	Absolute profile difference score between self-rating and perceived partner-rating	Small positive association of perceived similarity (r = .18)
Decuyper et al. (2012)	191 general population couples	Relationship Assessment Scale (Hendrick, 1988)	NEO Personality Inventory (Costa & McCrae, 1992)	Sum of differences between squared self-rating and partner-rating and r_{pa} profile correlation (McCrae, 1993)	Positive association of perceived similarity only for women and only when measured with r_{pa}; No association of perceived similarity for men

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Study	Sample	Outcome Measure	Trait Measure	Operationalisation of Perceived Similarity	Associations between Perceived Similarity and Relationship Quality
Tidwell et al. (2013)	187 speed-daters	Four-item self-made measure of romantic liking	14 self-characteristics with trait character (e.g. “friendly, “dependable”)	Absolute profile difference score between self-rating and perceived partner-rating, controlling for self-rating and perceived partner-rating	Positive association of perceived similarity on seven out of the 14 characteristics
Furler et al. (2014)	237 (mostly married) general popualtion couples	Relationship Assessment Scale (Hendrick, 1988)	Big-Five Inventory (John & Srivastava, 1999)	r_{pa} (McCrae, 1993) for self-ratings and perceived partner ratings while controlling for self-ratings and perceived partner-ratings	Small (β = .10) positive association of perceived similarity
Barranti et al. (2017)	322 general population individuals	Dyadic Adjustment Scale (Spanier, 1976)	Self-rating and perceived partner-rating on all Big-Five traits	Polynomial Regression and Response Surface Analysis	Similarity effect with rising ridge in conscientiousness; mainly interaction driven similarity effect in openness

Note. MMPI = Minnesota Multiphasic Personality Inventory

perceived similarity in openness was more important if individuals perceived themselves to either be very open, or not open at all.

In sum, this literature review shows that perceived similarity in human values and relationship ideals are less researched than perceived similarity in personality traits, which has received the most attention by far. However, while findings regarding the effects of perceived value similarity and perceived relationship ideal similarity are comparatively rare, they reveal more consistent evidence for positive associations with relationship quality than findings regarding perceived trait similarity. The effect of perceived similarity in relationship ideals is especially strong and reliable. On the flip side, findings regarding perceived trait similarity are often contradictory and have used many different methods to operationalise and analyse similarity in different samples. In line with my framework, I conclude that the connection of perceived similarity in human values and relationship ideals might be stronger than the connection of perceived similarity in personality traits, because the former are more informative about goal similarity, with perceived similarity in values signalling similar personal goals, and the perceived similarity in relationship ideals signalling perceived relationship goals. However, previous literature has not compared these dimensions directly to see if the effects of these different dimensions truly differ in strength, which will be a novel aspect of the research in this thesis.

Clarifying the Causal Direction

The second question I have presented in this second part of this introductory chapter related to the causal direction of the connection of perceived similarity to relationship quality. The framework I have described depicts a unidirectional connection from perceived similarity to relationship quality. In line with the information processing theory and transactive goal dynamics, perceiving similarity in any dimension should signal information about shared goals, which should then lead to (perceptions of) goal support, enhancing relationship quality. However, I recognise that influences might go both ways. In addition to being perceived through real-world inferences or bias (i.e., bottom-up; Murray et al., 1996, 2002), perceived similarity might also be the consequence of relationship quality (i.e., top-down; Morry, 2005). There always exists the possibility that relationship quality causes both perceptions of goal support and perceptions of similarity. Because there is no evidence about which causal path is dominant in natural dyads, the present thesis will treat both causal directions as hypotheses to be tested in longitudinal research.

Past theory suggests both bottom-up mechanisms (i.e., lower-level personal self and partner perceptions causing higher-level dyadic relationship quality perceptions) and top-down mechanisms (i.e., higher level dyadic relationship quality perceptions causing lower-level self and partner perceptions). A part of my framework is derived from the information

processing theory (Ajzen, 1974; M. F. Kaplan & Anderson, 1973), is an unambiguous bottom-up theory. It construes relationship quality as the consequence of perceived similarity, and the positive valence of the information that is inferred from perceiving similarity (Montoya & Horton, 2004). The empirical evidence for the bottom-up causal direction comes mostly from the use of the bogus-stranger paradigm (Byrne et al., 1971; Sillars, 1985). The paradigm presents participants with information about a hypothetical stranger (e.g., a filled-out personality or attitude questionnaire) and then asks participants how much they would like to interact with the person (i.e., liking). Such studies generally find positive associations between similarity to the hypothetical stranger and liking (Byrne et al., 1971; Byrne & Rhamey, 1965). Remember that Ajzen (1974) showed how similarity in personality traits was only predictive of liking if the traits were valued positively, concluding that similarity only mattered if it led to positive evaluation of the partner. Evidence congruent to Ajzen's (1974) was later obtained by Montoya and Horton's (2004) mediational analysis and Montoya and Horton's (2013) meta-analysis. In more recent studies using a dating context, experimental studies manipulating similarity found increases attraction when similarity was perceived in dimensions of personality such as optimism (Böhm et al., 2010), definitely conveying positive information, and attachment styles (Klohnen & Luo, 2003), where a similar attachment style signalled a familiar environment and confirms expectations.

The top-down notion (known as the attraction-similarity hypothesis) was formulated by Morry (2005). It postulates that individuals learn a positive association between similarity and relationship outcomes early in the relationship, due to the importance of perceived similarity for attraction (e.g., Luo, 2009). These positive experiences lead individuals to develop lay beliefs about the importance of similarity for relationship functioning. When the individuals then find themselves in well-functioning relationships, these lay beliefs cause them to assume that because their relationships are good, the partners must be similar to themselves. In line with this reasoning, Morry (2005) showed that priming positive or negative experiences with the partner led to increases or decreases in relationship quality and friendships. Further, Morry et al. (2011) showed that priming romantic relationship quality had a stronger effect on similarity perceptions for relationship-relevant personality traits, than on similarity perceptions for relationship irrelevant traits. This finding shows that perceptions are formed in a manner that is consistent with beliefs about traits that are important in relationships.

However, this finding also implies a viable top-down pathway for my hypothesised framework. Perceived goal support, perceived goal similarity, or perceived personality similarity could all be perceived is very desirable in a relationship. Thus, it is plausible that individuals who perceive high relationship quality might also perceive higher levels of these variables. I therefore concede that, while my framework denotes a bottom-up framework

(because it is based on the information processing theory, which is a bottom-up perspective), all four variables might be connected top-down as well, making it important to compare bottom-up and top-down causal directions in terms of their strength in a longitudinal sample.

Clarifying the Causal Mechanism

In this introduction, I have argued that perceived similarity in any psychological dimension should be important for relationship quality to the extent that the similarity signals goal coordination and thus goal support. It is worth elaborating on the implications of this reasoning for differentiating predictions regarding values from predictions regarding relationship ideals and personality traits.

To begin, relationship goals have shared outcomes which often can only be achieved through cooperation. Perceived similarity in relationship goals should therefore always be beneficial, and perceived dissimilarity in relationship goals should always be problematic. When relationship goals are perceived to be shared, individuals should even develop a bias towards perceiving their partner's behaviour as goal support, as humans are inherently predisposed toward interpreting observed behaviour in terms of assumed goals (for a review, see Van Overwalle & Baetens, 2009). Because the outcome is shared for both people, a perceived action of one partner towards the goal positively contributes to the other partner's goal pursuit, making the perceived action interpersonally multifinal (Fitzsimons et al., 2015). For similar reasons, perceived disagreement on a relationship goal will also rarely indicate support. Why would a person interpret their partner's actions as support for a relationship goal the partner is not perceived to want? Such perceptions might lead the person to conclude a zero-sum situation in their relationship, where their goals can only be obtained at the expense of their partner's goals, and vice versa. The resulting non-zero sum beliefs would lead to lower partner responsiveness, compared to people with nonzero-sum mindsets (i.e., the relationship as a win-win situation; Crocker et al., 2017).

In contrast, personal goals do not necessarily have shared outcomes, and the partner is often not necessary to achieving them. Accordingly, perceived similarity or dissimilarity in personal goals might be beneficial or detrimental. The beneficial implications may arise when shared personal goals improve coordination, for example when similarity is used to generate commitment (Huang et al., 2015), to facilitate implicit coordination (Shteynberg & Galinsky, 2011), or does not create rivalry (Tesser, 1988). When these conditions are met, a shared personal goal may increase (perceptions of) goal support and relationship quality.

However, there are also conditions wherein perceived similarity in personal goals might be detrimental. Consider Fishbach et al.'s (2011) finding that pursuing a personal goal with close others (rather than strangers) creates goal commitment. However, goal commitment is mostly important in early stages of goal pursuit, while individuals are focused

on goal progress at later stages (Koo & Fishbach, 2008). For goal progress, perceived similarity may or may not be as beneficial. For example, new weightwatchers reported feeling closer to other members in the group when they had just started the course (Huang et al., 2015). They were also more willing to support their fellow members in their pursuits, by sharing tips about weight-loss. However, after a few months, as individual progress became the focus, they became more distant to other members. This change in behaviour shows how others who are pursuing the same goal will be supported, as long as doing so generates commitment, and as long as signalling commitment is still important for motivating goal pursuit. As soon as commitment was secured and progress was in focus, support decreased (Fishbach et al., 2011; Fitzsimons & Fishbach, 2010; Koo & Fishbach, 2008). Potentially worse, having similar personal goals and passions might lead to active competition between partners. According to the self-evaluation maintenance model (Tesser, 1988), being outperformed by a spouse might be perceived as a threat by individuals, due to the close relationship partners share. This, in turn, makes partner support unlikely, as supporting the partner would increase the partner's performance even more, or signal submission. It might also lead to resource competition as partners who pursue the same individual goals (e.g., career goals) in highly interdependent relationships have only a limited pool of shared resources (imagine, for example, conflict of who gets to work and who has to watch the kids; Fitzsimons et al., 2015).

The above examples also illustrate how perceived dissimilarity in personal goals does not have to be a negative influence on relationship quality. If pursuing similar performance-oriented goals can lead to competition, then complementarity in these dimensions might be good for the relationship. Such a complementarity effect was found by Pilkington et al. (1991), who asked partners about the activities that were important to themselves or their partner, while also rating their own and their partner's level of performance in each activity. Crucially, individuals were less likely to credit their partner if the activity was perceived to be important to both partners. Only when the activity was rated as important to the partner, but not the self, would the partner reliably be credited as the superior performer. Because giving positive feedback is an important form of goal support (Morrison & Weldon, 1990), complementarity in some types of goals might be more important for goal support than similarity.

In sum, the pivotal role of goal coordination and goal support in my framework leads me to predict that perceived similarity in values (signalling personal goals) should be less important for relationship quality than perceiving similarity in relationship ideals (signalling relationship goals). Perceived similarity in relationship ideals should be particularly important because it is intrinsically informative about similarity in relationship goals, which is important for goal coordination, goal support, and relationship quality. No previous study has

compared the predictive strength of these types of similarity. Therefore, one aim of this thesis is to test this framework by showing that the role of perceived similarity in relationship ideals, values, and traits in relationship quality differs because these roles are mediated by goal similarity and goal support to different degrees.

Research Plan

The present thesis presents the first investigations of actual similarity in human values as they relate to multifaceted relationship quality in new college relationships using polynomial regression. It was the first investigation that separated standpoint and content to simultaneously examine value alongside traits, thereby revealing whether dyadic effects arise because of a fit in abstract goals or behavioural tendencies. Because previous studies on actual similarity have struggled to replicate effects even across similar samples (e.g., Dyrenforth et al., 2010), I aimed to replicate the effects I find in a longitudinal analysis, not only in a new sample, but also over time. Beyond examining actual similarity, I also conducted the first comparison of perceived similarity in values, relationship ideals, and traits in predicting relationship quality. In addition, I compared the strength of causal directions between perceived similarity and relationship quality in a longitudinal sample, and tested my novel theoretical framework proposing that goal support and coordination is important to explain any differences in effects of perceived similarity between the different psychological constructs (e.g., values and relationship ideals).

To achieve these aims in the most efficient way possible, the first and second studies presented romantic couples with questions about both their actual and their perceived values and traits. One consequence of this high volume of necessary questionnaire items is that it forced me to adopt very brief measures of values (the SSVS; Lindeman & Verkasalo, 2005), traits (the HEXACO adjectives; Lee & Ashton, 2008), and to measure perceived similarity in these dimensions with two items asking about global similarity for each dimension, presented after rating one's own actual personality on that dimension. This approach necessitated a focus on the content of the higher-order value types (ignoring facets), with a focus on perceived similarity in values and traits at a global level (e.g., "Overall, my partner's values are similar to mine", and "I believe that my partner and I agree on what is important in life" after completing the SSVS and traits-as-values measure). While this focus on global perceived similarity can be criticised as potentially not comparable to previous research using a difference score or profile correlation to measure perceived similarity (J. R. Edwards, 2001; Tidwell et al., 2013), it might nevertheless closely reflect individuals' idiosyncratic judgments, as argued earlier. Also, in personality research, a global assessment score such as the ones presented in this theses has only once been compared to self-partner-rating difference scores (Tidwell et al., 2013). Despite obtaining some effects from both approaches, the global rating was more strongly connected to relationship quality.

Study 1 included a cross-sectional sample measured at only one time point and comprised mostly of college age couples. Study 2 aimed to replicate the results obtained in the first sample in a new sample of college couples, within a longitudinal design asking couples about their personality and relationship quality at three measurement points over eight months. This design enabled me to test whether or not the effects found in Study 1 replicate both between-samples (comparing Study 1 and the first measurement wave of Study 2) and within-samples (comparing the effect at different waves of Study 2). The initial sample in Study 2 was also recruited using means identical to Study 1, to rule out demographic differences as explanations for failed replications. A key aim of this study was to present the first longitudinal investigation of the effect of human values on relationship quality and gain evidence for a stronger causal direction. Because it only contained some of the values and traits from Study 1 (those with interesting dyadic effects), it enabled me to test whether or not the findings replicate with more reliable long-form instruments (e.g., the SVS instead of the SSVS), ensuring independence of measurement technique. However, perceived similarity was again measured with global similarity assessments to prevent the questionnaires from being too time intensive.

Study 3 was conducted to test the predictions of my new theoretical framework for explaining the connection of perceived similarity to relationship quality. Compared to the other two samples, the third study included not only include college couples, but also individuals in romantic relationships more representative of the general population. In addition to the SSVS and a measure of relationship ideals, it also presented participants with measures of perceived similarity in values and relationship ideals and asked questions about their own personal and relationship goals, their partner's goals, and how much partner support they perceive in their goals. In line with information processing theory and transactive goal dynamics, I predicted that perceived similarity in values will be less important for relationship quality than perceived similarity in relationship ideals because either (a) perceived similarity in values is not as informative about personal goals as perceived similarity in relationship ideals is about relationship goals, or (b) perceived similarity in personal goals is not as important for goal support as perceived similarity in relationship ideals, or (c) a combination of both.

Because I construe relationship quality as a multifaceted evolution of the relationship (not the partner), all studies measure relationship quality using the PRQC (Fletcher et al., 2000b). The findings for actual similarity from the first and second sample will be presented in Academic Paper 1 (chapter 2) and Academic Paper 2 (chapter 3) respectively. The results for perceived similarity from all three studies can be found in Academic Paper 3 (chapter 4). This strategy enables a clear demarcation of two crucial stages in this research (i.e., Study 1

and Study 2), and it enables a more comprehensive evaluation of the framework I present to examine effects of perceived similarity.

Academic Paper 1:

The Role of Value Similarity in the Quality of Romantic Relationships

The Role of Value Similarity in the Quality of Romantic Relationships

Lukas F. Litzellachner[1*], Paul H. P. Hanel[1,2], Bas Verplanken[1] & Gregory R. Maio[1]

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[1]Department of Psychology, University of Bath, Bath, United Kingdom

[2]Department of Psychology, University of Essex, Colchester, United Kingdom

* Please address correspondence to Lukas Litzellachner, Department of Psychology, University of Bath, Claverton Down, BA2 7AY Bath, United Kingdom: l.f.litzellachner@bath.ac.uk

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Abstract

Previous research on the role of between-partner value similarity in the quality of romantic relationships has led to conflicting results. We believe this is partly due to two issues. Firstly, there have been methodological issues regarding the use of difference scores and profile correlations in previous literature. Second, the measurement of personal values and has often been confounded with the measurement of the related construct of personality traits. Using more robust statistical methods and a new framework for incorporating personality traits alongside values, we re-examined the role of value similarity in relationship quality within 174 romantic couples (348 individuals). To prevent some of the methodological issues around calculating scores of similarity we used polynomial regression and response surface analyses. These methods use both partner's self-reports to independently predict relationship quality, instead of computing problematic difference scores or profile correlations. The analyses revealed both similarity complementarity effects, and primarily when the expression of values in traits was measured. Specifically, relationship quality was enhanced by complementarity in the trait expression of self-transcendence and conservation values. We interpret the roles for these particular values as extending past evidence regarding the influence of active benevolent, and prosocial orientations in different stages of relationships.

Do “birds-of-a-feather” flock together or do “opposites attract”? This age-old question of whether similarity between partners is good for a romantic relationship is far from settled. A quick Google search brings up articles that boldly proclaim “opposites do not attract, scientists prove” (Knapton, 2016) or alternatively “opposites DO attract” (L. Watson, 2013), with both citing scientific work in favour or against the effect of partner similarity on assortment (Bahns et al., 2012) or relationship stability (Frost & Forrester, 2013). In fact, researchers have found that similarity predicts couple assortment (Ajzen, 1974; Bahns et al., 2016; Bleske-Rechek et al., 2009; Montoya & Horton, 2013), greater relationship stability (Arránz Becker, 2013; Bleske-Rechek et al., 2009; Feng & Baker, 1994), and higher relationship quality (Acitelli et al., 2001; Gaunt, 2006; Gonzaga et al., 2007).

However, there is still some debate about the generalizability of similarity effects on relationship quality and about the psychological dimensions for which similarity matters (Amodio & Showers, 2005; Weidmann et al., 2017). For example, it is clear that similarity in religious and political attitudes matters (Bleske-Rechek et al., 2009; Byrne & Blaylock, 1963; D. Watson et al., 2004), evidenced by the high degree of partisan assortment in US-American couples (e.g., only 9% of marriages are cross-partisan, Rosenfeld & Reuben, 2015; see also Alford, Hatemi, Hibbing, Martin, & Eaves, 2011; Byrne & Blaylock, 1963). In contrast, the importance of similarity is less clear for other psychological constructs, such as human values or personality traits. With these constructs, researchers find only small to moderate similarity benefits for relationship quality (Dyrenforth et al., 2010; Gonzaga et al., 2007; Leikas et al., 2018; Luo, 2009; D. Watson et al., 2004; Weidmann et al., 2017), despite popular belief that similarity in these individual differences is fundamental (e.g., by the online dating service, eHarmony: 8,635,167, 2009).

In this research, our theoretical interest was on providing a novel, robust examination of the importance of similarity in human values for relationship quality. To understand the role of similarity in values in relationship quality, we recognised the need to compare their role with the roles of similarity in traits. At the same time, this approach necessitated considering the relevance of specific motivational content encompassed by measures of values and traits and possible methodological issues with previous research. Both of these issues are elaborated below, before describing our approach to addressing these issues in the present research.

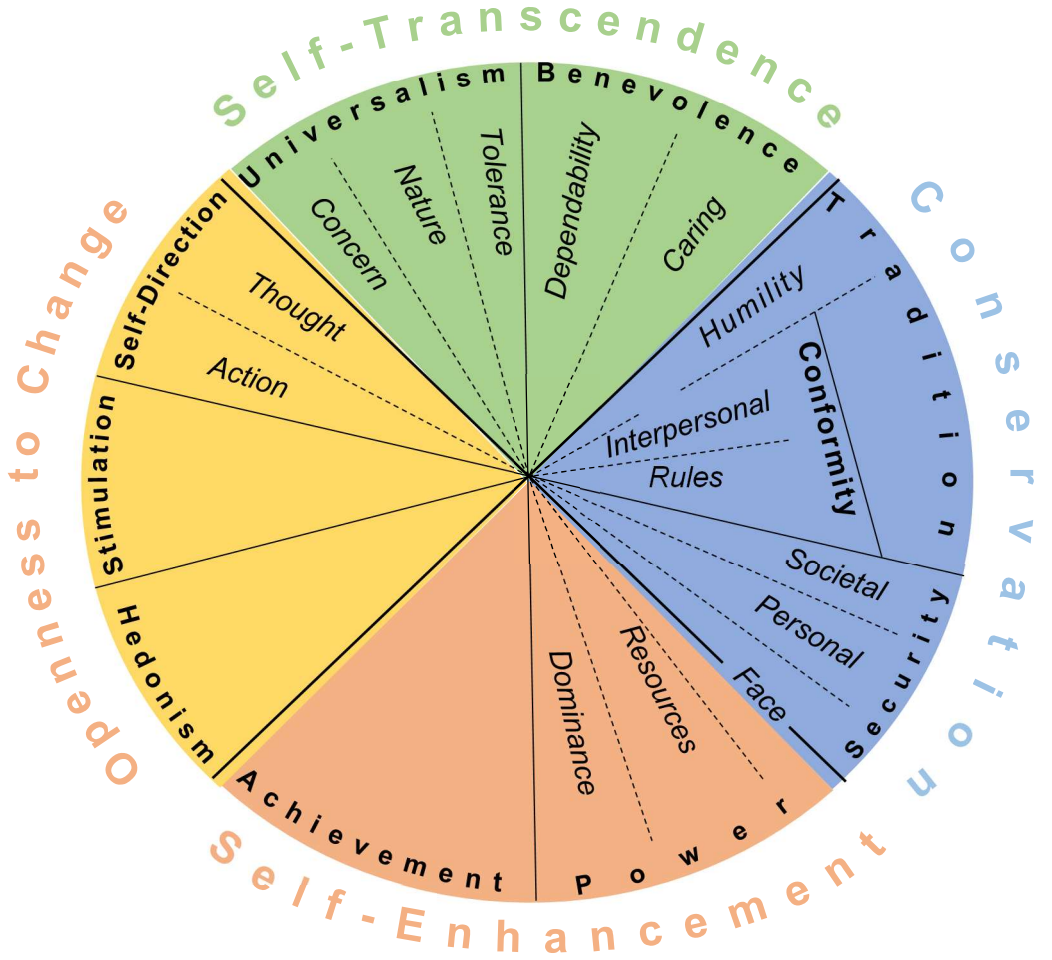
Differences Between Values and Traits

Human values are mentally represented as abstract goals (Rokeach, 1973; Schwartz, 1992, 2012), differing based on their importance to the individual. A continuum of motivations proposed by Schwartz (1992, 2012, see Figure 5) has been found to capture similarities and differences between values in over 80 nations (Schwartz & Sagiv, 1995).

The original version of this model described 10 distinct value types, which have been further subdivided to yield 19 value types in a revised model (Schwartz et al., 2012). In the circumplex, neighbouring values are motivationally similar (e.g., “security” and “conformity”), whereas opposite values are motivationally incongruent (e.g., “power” and “benevolence”).

Figure 5

The value circumplex of the extended Schwartz model



Note. Colour-coded sections represent the four higher-order value types, while the original ten lower-order value types are written in bold. Subtypes of the extended model are written in italics. “Face” and can be considered part of either self-enhancement (power) or conservation (security), while “humility” can be either considered part of self-transcendence (benevolence) or conservation (tradition). Hedonism is often shown as split between openness and self-transcendence We considered “face” and “humility” both as a part of conservation, and “hedonism” as part of openness for the purpose of this paper.

Few studies have investigated the impact of value similarity on relationship quality, yielding overall mixed results. Studying Israeli parents, Gaunt (2006) found that correlations between the parents' value profiles predicted relationship quality for both sexes. Meanwhile, Luo and Klohnen (2005) find only a very small effect of partner value similarity for men's relationship satisfaction, and none at all for women's relationship satisfaction. However, the positive effect of value similarity did not replicate in a sample of developing relationships (Luo, 2009).

Similar to values, traits are often defined as trans-situationally stable (Cobb-Clark & Schurer, 2012; Roberts et al., 2004) patterns in thoughts, feelings, and actions (McCrae & Costa, 2009). Traits are typically measured by asking respondents about the extent to which different behavioural patterns describe them (e.g., the NEO-FFI - 3; McCrae, Costa, Jr., & Martin, 2005). Trait structures have been derived from factor analysis of adjectives describing behavioural consistencies, with a well-known outcome being a five-factor solution that includes dimensions for emotional stability (or neuroticism), extraversion, agreeableness, conscientiousness, and openness (or intellect; Goldberg, 1990). Another frequent solution (known by the acronym HEXACO) adds honesty-humility as a sixth dimension (Ashton et al., 2004).

Evidence for the importance of trait similarity in romantic relationships has been mixed. Across three large household panels from different countries, Dyrenforth et al. (2010) found that trait similarity contributed only 0.5% of variance in predicting relationship satisfaction. However, the methodology between the household panels differed slightly (e.g., different five-factor personality and relationship quality measures) and similarity effects did not replicate in different panels. The researchers concluded that own levels of personality are more informative than dyadic influences (i.e., partner effects or congruency effects). In addition, Decuyper et al. (2012) found that trait similarity had a positive effect for the relationship quality of women, but not for men, whereas the only positive effects of trait similarity found by Robins et al., (2000) was limited to men. Other studies simply find no association of trait similarity to relationship quality (Glicksohn & Golan, 2001; D. Watson et al., 2004) or even positive complementarity effects (Shiota & Levenson, 2007; Tidwell et al., 2013; Zhou et al., 2017).

Standpoint Versus Content

Researching values and traits separately prevents us from discovering their simultaneous connection to latent individual differences in relevant motivations. The values and traits assessed in the SVS and HEXACO model are correlated (Parks-Leduc et al., 2015; Roccas et al., 2002), suggesting that values and traits may overlap in motivational content. For instance, a person who deems humility to be very important in the SVS may

report frequent humble or modest behaviour in a HEXACO questionnaire. This overlap was illustrated by Anglim et al. (2017), who presented a meta-analysis of relations between the values of Schwartz's (1992) model and the HEXACO personality traits. Their findings showed that most values correlated reasonably well with at least one trait. At the same time, there are also examples of motives that may be unique to either model. For example, in another meta-analysis (Parks-Leduc et al., 2015), neuroticism did not show any significant relations to values.

Nevertheless, conclusions about motivational overlap between values and traits from prior data are equivocal because contemporary research overlooks that values and traits not only differ in motivational content, but also in subjective standpoint (Hanel & Maio, 2020). By motivational content, we mean different aims assessed by values or traits (e.g., "tradition", "extraversion"), while subjective standpoint refers to the difference between current and desired state, with values being desired goals and traits being current behavioural dispositions (Roccas et al., 2002). Importantly, the assessment of each construct can be recast to focus on either behavioural dispositions or goals. For instance, the value of benevolence can be rephrased to focus on action, "I am benevolent", rather than goals, "Benevolence is important to me". Likewise, the trait of conscientiousness can be re-cast through items focusing on goal content, "Being conscientious is important to me", rather than behaviour, "I am conscientious". Some combinations of content-standpoint interactions have not yet been investigated (e.g., "neuroticism values", "tradition traits"). This conceptual and empirical gap is important, as the relevance of value and trait content to relationship quality might change if the content is measured in a different standpoint (e.g., with the value content assessed as action dispositions).

Assessing human value content in terms of current action dispositions might have added explanatory power in relationships, because the behavioural manifestations may be more accurately perceived by partners compared to values per se (McDonald & Letzring, 2016). Presumably, this high visibility makes dispositions important for active assortment (Gonzaga et al., 2010), with most individuals having a very clear picture of what their ideal partner is like (D. Watson et al., 2014). For many people, these ideal visions tend to describe the partner as possessing traits similar to their own (Figueredo et al., 2006). Beyond meeting ideal standards, sharing behavioural dispositions might make a partner easier to understand, facilitating coordination, and empathy (Anderson et al., 2003; Gonzaga et al., 2007).

Assessing personality trait content in terms of abstract values might also have high relevance, because sharing goals is beneficial for relationships (Avivi et al., 2009; Fitzsimons et al., 2015; Fowers & Owenz, 2010; Gere et al., 2011). Recognizing someone as cooperatively striving for a common goal binds people together (e.g., Sherif, 1958), leading

to the formation of a common identity (Gere et al., 2011; Lembke & Wilson, 1998; Paris et al., 1972) that can be shared by relationship partners (Agnew et al., 1998). Indeed, the importance of goals in relationships has received more attention following the emergence of the eudaimonic theory of marital quality (Fowers & Owenz, 2010) and the theory of transactive goal dynamics (TGD; Fitzsimons et al., 2015). Both theories emphasise joint goal pursuit, that is, perceiving and pursuing shared ends. The eudaimonic theory construes relationship quality as being the result of meaningful activity in the pursuit of shared goals. Meanwhile, TGD characterizes relationships as closed systems of interdependent partners pursuing goals together, with relationship quality being inextricably tied to the efficiency of coordinated goal pursuits. These frameworks support the proposition that value similarity should be beneficial because it signals agreement on which goals to pursue, enabling better goal coordination.

It is now possible to investigate whether or not the effects of value and trait similarity rest on a specific combination of content and standpoint, using the new measurement approach brought forward by Hanel and Maio (2020). Their measure makes it possible to dissociate the effects of content and standpoint by rewording values as traits (e.g. “I act in a way that promotes protecting the environment”) and traits as values (e.g. “as a guiding principle in my life, it is important to me to be orderly”). The measure has reproduced the circular structure of values and the factor structure of traits when coded in the other standpoint (i.e., values-as-traits and traits-as-values, respectively) and revealed that certain outcomes either depend more on content (i.e., traits vs values-as-traits or values vs traits-as-values) or standpoint (e.g., traits vs traits-as-values or values vs values-as-traits). The present study will use this new method to test whether the way that values are measured makes a difference to modelling the effects of value similarity on relationship quality, while also considering whether the way that traits are measured makes a difference to modelling the effects of trait similarity on relationship quality.

Methodological Limitations of Previous Research

A key problem with interpreting past findings is the prevalent usage of difference scores and profile correlations as measures of similarity. In a series of publications, Edwards (1993, 2001, 2002) detailed how these practices lead to conceptually ambiguous results, low reliability, artificial analytical restrictions, and false negatives *or* false positives. Many of these problems arise because difference scores and profile correlations reduce a fundamentally three-dimensional relationship (i.e., actor personality, partner personality, and relationship quality) to a two-dimensional one (i.e., difference score/profile correlation and relationship quality), while discarding information about the directionality of the between-subject differences and the importance of the absolute level at which the difference occurs. The last point is especially relevant for research on value similarity because values differ in

centrality to the self (Verplanken & Holland, 2002). Partner differences in more important, central values might carry more weight than differences in unimportant values. To avoid these problems, Edwards suggested using polynomial regression, which treats the components (the partner's individual scores) as independent predictors and controls for quadratic effects to prevent confounding them with interactions (i.e., complementarity effects).

This method has been applied in two recent investigations of the effects of value and trait similarity in relationships. One focused on both values and traits (Leikas et al., 2018) and the other focused solely on traits (Weidmann et al., 2017). In line with previous research, however, both articles report only small effects or null effects on relationship quality for both value and trait similarity. Thus, there is a lack of robust evidence that value and trait similarity matter in relationship quality.

Nevertheless, two important issues make it important not to rely on these null findings. First, prior studies did not consider the important role of differing motivational content and standpoints in trait and value measures. This gap makes it unclear whether, for example, similarity in values-as-traits matters more than values. This pattern might emerge because of the way in which the values-as-traits reflect both the high self-centrality of values to the self-concept (e.g., Rokeach, 1973) alongside their behavioural trait manifestations, over and above the importance of the values per se. Conversely, similarity in traits-as-values might matter more than the traits, by virtue of assessing the degree to which the traits are both manifest in behavioural dispositions and regarded as ideal standards of how one should behave. Further, scales used by previous research often confound value and trait standpoints. For example, the Extra-short 5 scale (Konstabel et al. 2017), used by Leikas et al. (2018), aims to measure traits but also features items asking about values (e.g., Item 7: "I have quite traditional values", or Item 14: "I am a reliable person who values ethical principles"). These shortcomings make it difficult to clearly interpret their findings as evidence for the importance of similarity in certain abstract goals or behavioural patterns, holding back the development and verification of related theory.

Second, the prior studies possessed other important measurement limitations. They used a single-item measure of relationship quality and long-standing couples that were highly committed (Leikas et al., 2018), which potentially influences the effect of similarity (Rusbult & Van Lange, 2003). Indeed, if the importance of similarity varies with the duration of the relationship (Shiota & Levenson, 2007), a lack of robust and methodologically rigorous knowledge on the role of similarity in newer couples represents a major empirical gap because less committed relationships exhibit more variance in relationship quality, making available more variance for prediction from similarity (D. Watson et al., 2004)

The current work addressed these issues by providing a polynomial regression analysis of the role of value similarity in relationship quality, while more precisely identifying their role through the application of recent advances in assessing the motivational content of both values and traits from different standpoints. We also used a more robust, multifaceted measure of relationship quality (Fletcher et al., 2000), and included newer relationships (young, general population couples instead married spouses or parents). Including newer relationships enabled us to answer questions regarding the importance of value similarity in early relationship formation and maintenance (Luo, 2009).

Method

Sample

We recruited 549 individuals in relationships older than 3 months for a 20-minute long online survey. From these individuals, we were able to match 176 couples. However, two couples had to be removed (one because the couple answered the survey twice and one because one member answered the survey in under 10 minutes, which was one of our data quality exclusion criteria), leaving 174 couples in the analysis (348 individuals; 180 female, 166 male, 2 other gender; M_{age} = 22.89, *SD* = 5.78). The average relationship duration was 31.45 months (*SD* = 49.03). Thirteen couples were same-sex relationships. Most couples were unmarried (94%) and not cohabiting (64%). Most participants were either students (72%) or in employment (20%).

The sample size is suitable to detect medium sized effects on single coefficients in multiple regression with five predictors (like the polynomial regression model; f^2 = .05, α = .05, 1-β = .80), as determined by power analysis using G*Power (Faul et al., 2007). Respondents were mostly recruited online, on the campus of an English University, and with flyers on the streets of two English cities. To recruit both members of a dyad, respondents were asked to send a survey-link to their partner. In appreciation for their time, we gave a £50 Amazon voucher to one randomly selected couple.

Measures[3]

[3] Our focus here is on effects of value similarity between partners. Nonetheless, the study included ancillary measures for different purposes not covered in this report. These questions were about perceived similarity (reported in Litzellachner et al., 2020), self-monitoring (Snyder, 1974), relationship ideals, perceived attractiveness (Bleske-Rechek et al., 2009) and five questions from the DAS relating to agreement on dimensions such as religion and politics, and a single-item measure of relative relationship happiness (Spanier, 1976). Because our main outcome of interest was the multifaceted relationship quality assessed by the PVQC (Fletcher et al., 2000), results for other relationship quality outcomes will not be discussed in this paper. However, results for the single-item happiness measure can be found in the supplementary materials. No significant dyadic effects were found with this less reliable instrument.

Matching. Respondents answered twelve short questions about themselves and their partner to generate a personal code for themselves and their partner. Matching codes were used to identify couples in the dataset. If two codes differed by only one character, we looked for communalities in the potential partner's demographical descriptions to match them.

Values. The importance of each value type in Schwartz et al.'s (2012) refined value theory was assessed with a single item. Each item consisted of the name of the value type, accompanied by a short description of its content. Therefore, this value instrument was similar to the short Schwartz Value Survey (SSVS; Lindeman & Verkasalo, 2005). Respondents answered all value questions (meaning both values and traits-as-values) using a 9-point scale ranging from -4 ("Opposed to my values") to +4 ("Of supreme importance"). The only other labelled point was 0 ("Of no importance"). Because some value types are assessed by a single item, we grouped related values together and analysed them as the four higher-order value types of self-enhancement, openness to change, self-transcendence, and conservation. The internal consistency of these indices was adequate for self-transcendence (α = .70, M = 2.34, SD = 0.96), self-enhancement (α = .69, M = 0.13, SD = 1.57), and conservation (α = .60, M = 1.41, SD = 0.92), but low for openness to change (α = .52, M = 2.23, SD = .84), consistent with other results obtained from short value measures (Sandy et al., 2017).

Traits. We used a 12-item measure consisting of adjectives measuring the HEXACO traits (Lee & Ashton, 2008). Each of the six traits was represented by the two highest loading items identified in Hanel and Maio's (2020) studies. Respondents answered all trait questions (meaning both traits and values-as-traits) using a 9-point scale ranging from -4 ("Strongly disagree") to +4 ("Strongly agree"). Other labelled points were -2 ("Disagree"), 0 ("Neutral") and 2 ("Agree"). Half of the internal consistencies were good (Extraversion: α = .86, M = 0.47, SD = 2.11; Openness: α = .86, M = 1.42, SD = 1.78; Emotionality: α = .80, M = 1.86, SD = 1.78), with the others being adequate (Conscientiousness: α = .69, M = 1.57, SD = 1.71; reverse Honesty-Humility: α = .65, M = 0.91, SD = 1.72; Agreeableness: α = .61, M = 1.50, SD = 1.52).

Values-as-Traits and Traits-as-Values. Following Hanel and Maio (2020), we asked every respondent to answer the same value and trait items twice, once phrased as values and once phrased as traits. When values were phrased as traits (SSVS-T), respondents were asked to describe themselves, and the phrase "I act in a way that promotes" was placed in front of every value item (e.g., "I act in a way that promotes *Achievement"*). Conversely, when traits were phrased as values (HEXACO-V), respondents rated the importance of the item as a guiding principle in their lives, and every trait item started with the word "being" (e.g., being *extraverted*). Because the factor structures for

values and traits are conserved when rewording (Hanel & Maio, 2020), we computed the four higher-order value types from values-as-traits and the six HEXACO dimensions from traits-as-values. Internal consistencies in these new values-as-traits (Self-Enhancement: α = .62, M = 0.04, SD = 1.49; Openness to change: α = .54, M = 1.74, SD = 1.00; Self-Transcendence: α = .71, M = 2.05, SD = 1.06; Conservation: α = .63, M = 1.25, SD = 1.00) domains and traits-as-values dimensions (Honesty-Humility: α = .60, M = 1.91, SD = 1.55; Emotionality: α = .68, M = 1.58, SD = 1.45; Extraversion: α = .81, M = 0.95, SD = 1.59; Agreeableness: α = .52, M = 2.16, SD = 1.23; Conscientiousness: α = .70, M = 1.88, SD = 1.29; Openness: α = .86, M = 1.69, SD = 1.43) were similar to the original measures.

Relationship Quality. Respondents rated the quality of their relationship using the 18-item Perceived Relationship Quality Component scale (PRQC; Fletcher, Simpson, & Thomas, 2000). This measure taps six aspects of relationship satisfaction, the average of which we report as relationship quality (α = .94, M = 6.17, SD = 0.71). Items were phrased as questions (e.g., “How satisfied are you with your relationship”), which were answered on a 7-point scale ranging from 1 (“Not at all”) to 7 (“Extremely”).

Inclusion of the Other in the Self. To measure closeness, or inclusion of the other in the self (IOS: Aron, Aron, & Smollan, 1992), participants were presented with seven pairs of circles that overlapped to an increasingly larger extent. For every pair, one circle was labelled “Self” and the other “Partner”. Respondents were then asked to indicate which pair of circles best represents their relationship, and higher scores reflected more overlap in the pair of circles chosen from the 7 pairs available (M = 5.04, SD = 1.18).

Procedure

After obtaining information about the study and giving informed consent, the participants randomly received either a block of predictor measures (e.g., all trait and value measures), or a block of outcome measures (e.g., the PRQC and IOS). Measures within each block were randomized, and items within each measure were presented to each participant in a random order. After completing both blocks, participants answered demographic questions. They then had a chance to comment, leave their e-mail for entry into the prize draw, and read the on-screen debriefing information.

Statistical Analysis

Polynomial Regression. We used the R-Software Environment (R Development Core Team, 2017) and the RSA-package by Schönbrodt and Humberg (2018). Polynomial regression predicts the outcome using actor and partner variables, their product, and their quadratic terms. Additionally, the relationship quality responses given by partners in dyadic datasets are likely to be interdependent. Because ignoring hierarchical structures in the data

can lead to erroneous findings (Musca et al., 2011), we let the intercept of each couple vary randomly in multilevel polynomial regression (Equation. 8):

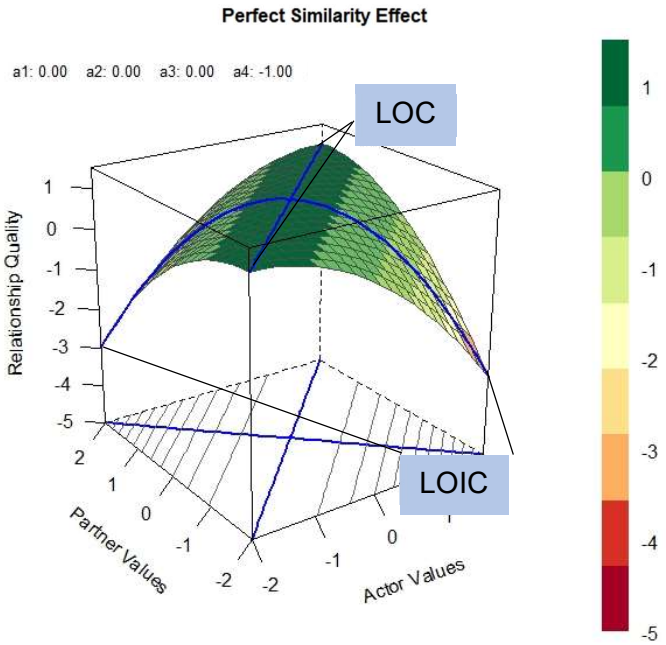
$$RQ_{Aj} = \beta_0 + \beta_1 Pe_{Aj} + \beta_2 Pe_{Pj} + \beta_3 Pe_{Aj}^2 + \beta_4 Pe_{Aj} Pe_{Pj} + \beta_5 Pe_{Pj}^2 + r_j + e_{Aj} \quad (8)$$

where *RQ* represents a score of relationship quality, *Pe* represents the standardised importance rating of any trait or value content, the subscript *A* represents an actor of couple *j*, the subscript *P* represents their partner. The model estimates linear effects of the actor's value importance (β_1), linear effects of the partner's value importance (β_2), quadratic actor effects (β_3), an actor-partner interaction effect (β_4), and quadratic partner effects (β_5). The variable *r* denotes how far the intercept of couple *j* deviates from the overall intercept β_0. Thus, the intercept differs for each couple (i.e., a random intercept), while the other coefficients are applied to all couples equally (i.e., fixed effects). Our model is thus equal to the multilevel actor-partner independence model (Kenny & Kashy, 2015), extended by an interaction term and two quadratic effects (Schönbrodt & Humberg, 2018).

Response Surface Analysis (RSA). As shown in Figure 6, RSA uses fixed-effects coefficients obtained from polynomial regression to construct a three-dimensional (i.e., actor personality, partner personality, and relationship quality) response surface (J. R. Edwards, 2002). For this purpose, response surface components ($a_1 - a_4$) are calculated, which represent the slope of the line of congruence (LOC: where actor and partner scores are equal; a_1), the curvilinear effect on the LOC (a_2), linear effects on the line of incongruence (LOIC; where actor and partner scores are opposites; a_3), or curvilinear effects on the LOIC (a_4). For a true effect of similarity, there should be a negative curvilinear effect on the LOIC ($a_4 < 0$) in the absence of other significant response surface components ($a_1 = a_2 = a_3 = 0$) qualified by a significant interaction term (β_4).

Figure 6

Response surface of a perfect similarity effect



Note. The LOC is shown on the ridge, while the LOIC curves from the left end to the right end of the plot (i.e., x = -2|y = 2 to x = 2|y = -2).

Such similarity effects would lead to a response surface resembling a *saddle shape* (Edwards, 2002, Figure 6).

Lastly, if all of these criteria are met, we check whether the first principal axis (the line where the outcome variable is maximized) is aligned with the LOC to determine whether relationship quality is truly maximised as a function of similarity. The parameters p_{10} and p_{11} represent the intercept and slope of the first principal axis. If the ridge of the response surface is aligned with the LOC, p_{10} should be close to 0, while p_{11} should be close to 1.

Following Weidmann et al. (2017), we do not interpret any response surface component not backed by the necessary regression coefficients. Analyses controlling for relationship duration, age, gender, cohabitation, marriage, and gender composition of the couple can be found in the supplementary materials.

Results

The correlations between all variables (Table 4) confirm that the measurement standpoint for values and traits informs understanding of their interconnections. For example, the correlation between self-transcendence as a value and trait agreeableness is lower than the correlation between self-transcendence as a value and self-transcendence as a trait. Despite strong relations across similar motivational content, there were no major redundancies, showing that the transformed content dimensions constitute unique new combinations of motivational content and standpoint, as reported by Hanel and Maio (2020).

Table 5 depicts the results of the values assessed by the SSVS, showing some noteworthy dyadic effects. There was an interaction in the analysis of self-enhancement values (β_4 = .14, p = .041) accompanied by a negative curvature on the LOIC (a_4 = -.32, p = .048) without any other significant RSA coefficients, thus suggesting a similarity effect. However, there also was a non-linear actor effect (β_3 = -.13, p = .017), and the first principal axis parameters were far away from 0 (p_{10} = -.38) and 1 (p_{11} = 1.65), respectively. Therefore, relationship quality was higher among individuals who had a slightly less self-enhancing partner when they themselves were low in self-enhancement, but a slightly more self-enhancing partner when they themselves were high in self-enhancement. This complementarity pattern also existed when self-enhancement traits were measured (β_4 = .15, p = .024; a_4 = -.49, p = .011), but with a stronger non-linear actor effect (β_3 = -.21, p <.001), and a significant non-linear partner effect (β_5 = -.13, p = .024; Figure 7a), more closely resembling a dome shape. As with value self-enhancement, the first principal axes did not align well with the LOC (p_{10} = -.21; p_{11} = 1.66)

There was only a significant main effect for openness to change values (β_1 = .15, p = .006), but there were independent actor and partner effects in openness to change traits

Table 4

Pearson correlation coefficients between all polynomial regression predictors, perceived similarities, and relationship quality

		SSVS				SSVS-T				HEXACO						HEXACO-V					
		SE	OTC	ST	CO	SE	OTC	ST	CO	H	E	X	A	C	O	H	E	X	A	C	O
SVS	SE	-																			
	OTC	.24	-																		
	ST	-.07	.31	-																	
	CO	.36	.20	.32	-																
SVS-T	SE	.75	.15	-.11	.24	-															
	OTC	.15	.54	.27	.02	.24	-														
	ST	-.16	.18	.72	.17	-.08	.34	-													
	CO	.25	.09	.29	.65	.33	.17	.39	-												
HEXACO	H	-.32	-.08	.15	-.00	-.37	-.09	.23	-.01	-											
	E	-.13	.06	.31	.18	-.08	.08	.33	.26	.12	-										
	X	.24	.19	.10	.03	.35	.36	.09	.12	-.18	.02	-									
	A	-.11	.01	.31	.22	-.11	.03	.35	.27	.25	.11	-.05	-								
	C	.11	-.05	.03	.18	.23	.03	.13	.26	-.07	.04	.04	.09	-							
	O	.05	.21	.23	-.00	.08	.32	.24	.01	-.02	.17	.22	.07	.02	-						
HEXACO-V	H	-.38	-.11	.22	.06	-.33	-.07	.21	.03	.53	.21	.-.09	.22	-.01	.02	-					
	E	-.15	.07	.31	.20	-.10	.07	.29	.24	.10	.68	.10	.10	-.02	.06	.13	-				
	X	.31	.24	.18	.21	.30	.26	.09	.17	-.13	.06	.73	-.06	-.00	.12	-.10	.09	-			
	A	-.18	.09	.48	.32	-.22	.04	.40	.28	.29	.27	-.17	.55	.04	-.03	.30	.23	.00	-		
	C	.16	.02	.11	.29	.19	-.02	.11	.26	-.00	.05	-.13	.07	.65	.00	-.05	.01	-.00	.21	-	
	O	.01	.24	.26	.05	.04	.24	.21	-.01	.02	.17	.09	.08	-.04	.74	.00	.13	.15	.13	.05	-
Relationship quality		.03	.14	.29	.16	.03	.18	.22	.15	.19	.15	.12	.13	.02	-.00	.17	.15	.06	.17	.06	-.03

Note. All $r > .10$ are significant at $p < .05$, All $r > .13$ are significant at $p < .01$ and all $r > .17$ are significant at $p < .001$. $N = 348$. SSVS-T = Values-as-traits, HEXACO-V = Traits-as-values, SE = self-enhancement, OTC = openness to change, ST = self-transcendence, CO = conservation, H = honesty/humility (reverse), E = emotionality, X = extraversion, A = agreeableness, C = conscientiousness, O = openness.

Table 5

Coefficients and RSA components for actual similarities in values phrased as traits and as values when predicting relationship quality

	SSVS				SSVS-T			
	Self-Enhancement	Openness to Change	Self-Transcendence	Conservation	Self-Enhancement	Openness to Change	Self-Transcendence	Conservation
Regression Coefficients								
β_1	.06	.15**	.18**	.16**	.06	.18***	.14*	.13*
β_2	-.03	.08	.08	.07	-.01	.17**	.13*	.11*
β_3	-.13*	.05	-.09	-.00	-.21***	.10	.04	-.03
β_4	.14*	-.04	-.02	-.14	.15*	.00	-.15*	-.38***
β_5	-.06	.05	-.07	.03	-.13*	.04	.09	.05
RSA components								
a_1	.04	.23	.26*	.23*	.05	**.34****	**.27***	**.24***
a_2	-.05	.06	-.18	-.11	-.19	.14	-.02	**-.36****
a_3	.09	.06	.10	.09	.07	.01	.01	.01
a_4	**-.32***	.14	-.14	.16	**-.49***	.13	.28	**.40***
R^2	.04*	.04*	.14***	.06**	.08***	.08***	.12***	.19***

Note. β_1 = actor traits, β_2 = partner traits, β_3 = actor traits^2, β_4 = actor traits x partner traits, β_5 = partner traits^2. N = 348. Significant RSA components backed up by their relevant regression coefficients are written in bold. The R^2-values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. SSVS-T = Values-as-traits.
*p < .05, **p < .01, ***p < .001

Table 6

Coefficients and RSA components for actual similarities in traits phrased as traits and as values when predicting relationship quality

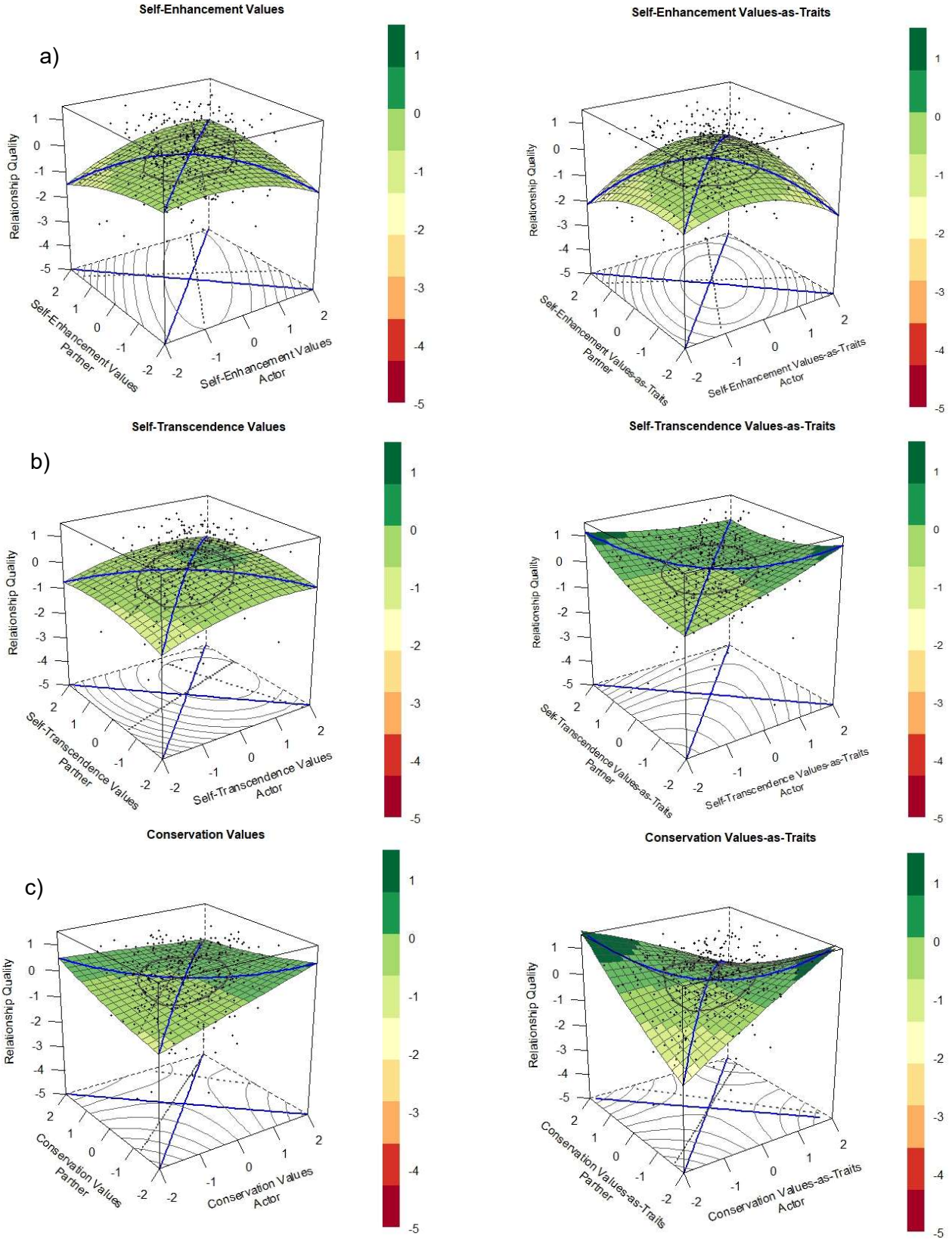
	HEXACO						HEXACO-V					
	H	E	X	A	C	O	H	E	X	A	C	O
Regression Coefficients												
β_1	.10*	.16*	.12*	.10	-.03	-.04	.07	.07	.05	.09	.05	-.03
β_2	.08	.11	.03	.08	.10	-.03	.05	.07	-.02	.02	.00	-.05
β_3	-.22***	.02	.04	-.03	-.06	-.06	-.13*	-.05	-.06	-.07	-.02	-.07
β_4	.03	-.05	-.08	-.11	.05	.09	-.09	-.17*	-.01	-.04	.26***	.03
β_5	-.15*	.06	.04	-.09	.07	-.03	-.13*	-.01	-.05	-.14*	-.09	-.06
RSA components												
a_1	.18	.27	.15	.19	.07	-.07	.12	.14	.03	.12	.05	-.08
a_2	**-.35****	.03	.00	.24	.06	-.00	**-.35***	-.22	-.12	-.25*	.15	-.10
a_3	.02	.05	.09	.03	-.13	-.02	.03	.00	.07	.07	.05	.02
a_4	**-.41***	.13	.17	-.01	-.05	-.19	-.18	.11	-.02	-.17	**-.37***	-.16
R^2	15***	.04*	.03	.08***	.02	.02	.12***	.07***	.02	.09***	.08***	.02

Note. β_1 = actor traits, β_2 = partner traits, β_3 = actor traits^2, β_4 = actor traits x partner traits, β_5 = partner traits^2, N = 348.
H = honesty-humility (inverse), E = emotionality, X = extraversion, A = agreeableness, C = conscientiousness, O = openness.
Significant RSA components backed up by their relevant regression coefficients are written in bold. The R^2-values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model.
HEXACO-V = Traits-as-values

*p < .05, **p < .01, ***p < .001

Figure 7

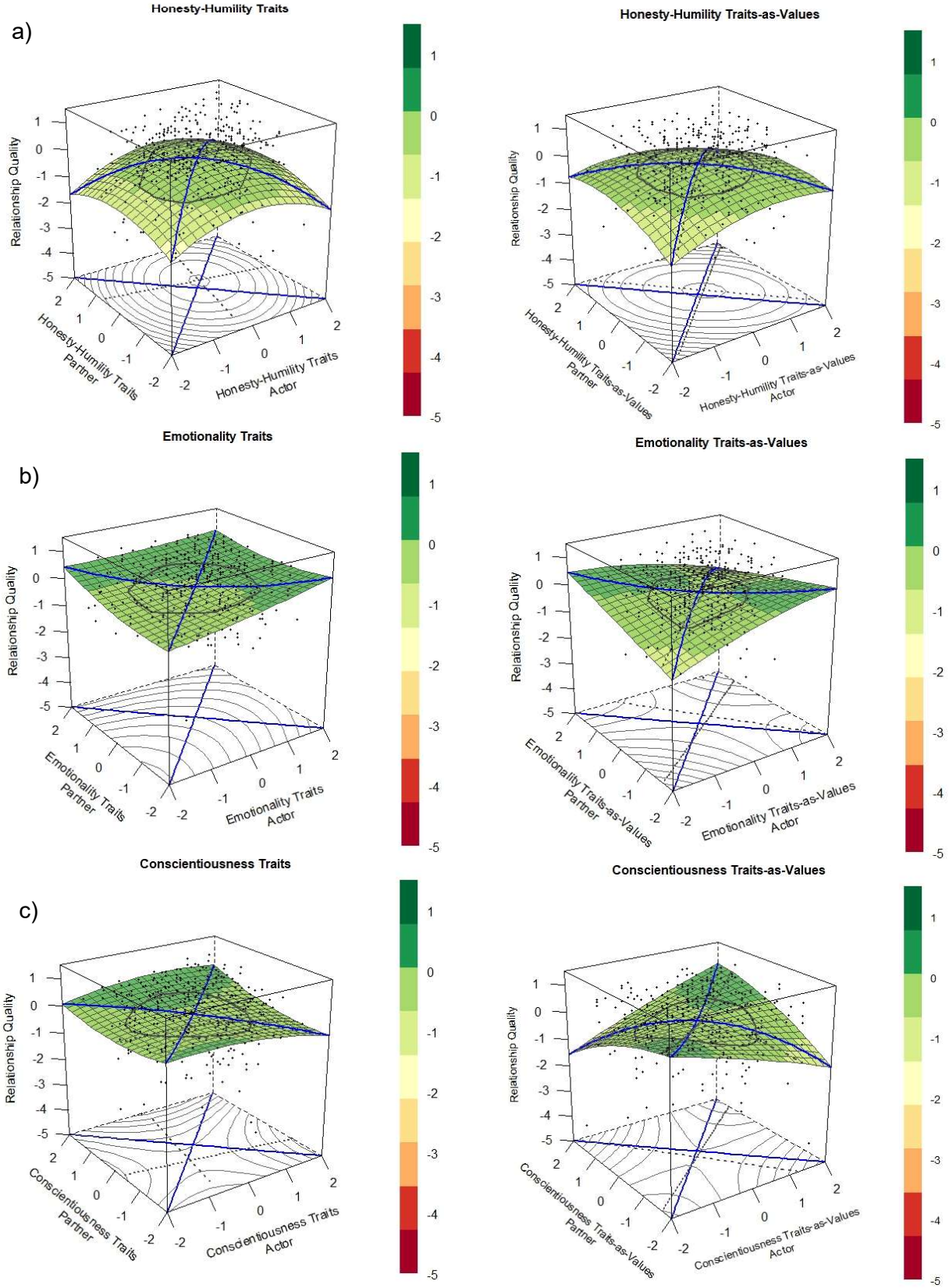
Response surface plots depicting actor's relationship quality as a function of actor and partner self-enhancement, self-transcendence, and conservation



Note. The left column depicts each content dimension when coded as values, whereas the right column depicts them when coded as traits. Dotted lines on the floor of each graph represent the principal axes, blue lines on the floor represent the LOC and LOIC.

Figure 8

Response surface plots depicting actor's relationship quality as a function of actor and partner honesty-humility, emotionality, and conscientiousness



Note. The left column depicts each content dimension when coded as traits, whereas the right column depicts them when coded as values. Dotted lines on the floor of each graph represent the principal axes, blue lines on the floor represent the LOC and LOIC.

(β_1 = .18, p < .001; β_2 = .17, p = .002), showing that the overall amount of openness to change traits in the relationship positively predicts relationship quality (a_1 = .34, p = .008). Similarly, when measured as values, only the actor's own self-transcendence seemed to matter (β_1 = .18, p = .001). Interestingly, trait self-transcendence showed a significantly negative interaction (β_4 = -.15, p = .024) in addition to a significant additive effect (β_1 = .14, p = .014, β_2 = .13, p = .027; a_1 = .27, p = .033). Relationship quality was lower among those couples where neither partner was high in benevolence, thus making a benevolent partner more important for actors low in benevolence (Figure 7b).

While there was only a positive actor effect of conservation values (β_4 = .16, p = .002), there was a significant negative interaction term in conservation values-as-traits (β_4 = -.38, p < .001; Figure 7c). It was accompanied by a significant negative curvature along the LOC (a_2 = -.36, p = .005), and a significant positive curvature along the LOIC (a_4 = .40, p = .011), highlighting that relationship quality was maximized when partners were opposites in conservation values-as-traits. In addition, there were independent actor (β_1 = .13, p = .029) and partner effects (β_2 = .11, p = .032), creating linear elevation along the LOC (a_1 = .24, p = .040). Thus, while the highest quality relationships have partners who are complementary in conservation values-as-traits, each partner's conservation values-as-traits have an independent positive connection with relationship quality as well.

Table 6 shows the results of the polynomial regression and RSA for the six HEXACO dimensions worded as traits and as values. For trait honesty-humility, there were significant linear (β_1 = .10, p = .049) and non-linear actor effects (β_3 = -.22, p < .001), and a significant non-linear partner effect (β_5 = -.15, p = .014). Combined with the significantly negative curvatures on both the LOC (a_2 = -.35, p = .006) and the LOIC (a_4 = -.41, p = .048), this indicates a dome shape (Schönbrodt et al., 2018), revealing that relationship quality is maximised when both partners are average to slightly above average in honesty-humility. Deviation from this region in each direction is related to a loss of relationship quality. While the same regression coefficients were significant for honesty-humility values (β_3 = -.13, p = .027; β_5 = -.13, p = .028), only the curvature on the LOC was significantly negative (a_2 = -.35, p = .013; Figure 8a).

Trait emotionality showed only a significant main effect (β_1 = .16, p = .026). However, when measured as a value, there was a significant interaction (β_4 = -.17, p = .011) between actor and partner. In the absence of any significant response surface component, this pattern indicates that the effect of one's partner emotionality depends on one's own level of emotionality (Figure 8b).

Lastly, there was a significant effect of similarity in valuing conservation. The significant interaction (β_4 = .26, p < .001) was accompanied by a significantly negative curvature on the LOIC (a_4 = -.37, p = .039), in the absence of a linear effect on the LOIC (a_4 = .05, p = .389) and non-significant effects on the LOC (a_1 = .05, p = .633; a_2 = .15, p = .238). Looking at the first principal axis components, the intercept was close to 0 (p_{10} = -.10) and the slope was closer to 1 (p_{11} = .79), indicating a good degree of overlap with the LOC, and thus a true similarity effect. Partners who value conscientiousness to a similar extent exhibited higher relationship quality. Consistent with previous findings (Leikas et al., 2018), there was no effect of conscientiousness when measured as a trait (Figure 8c).

Exploratory Analysis: Moderators of the Conservation Values-as-Traits Dissimilarity Effect

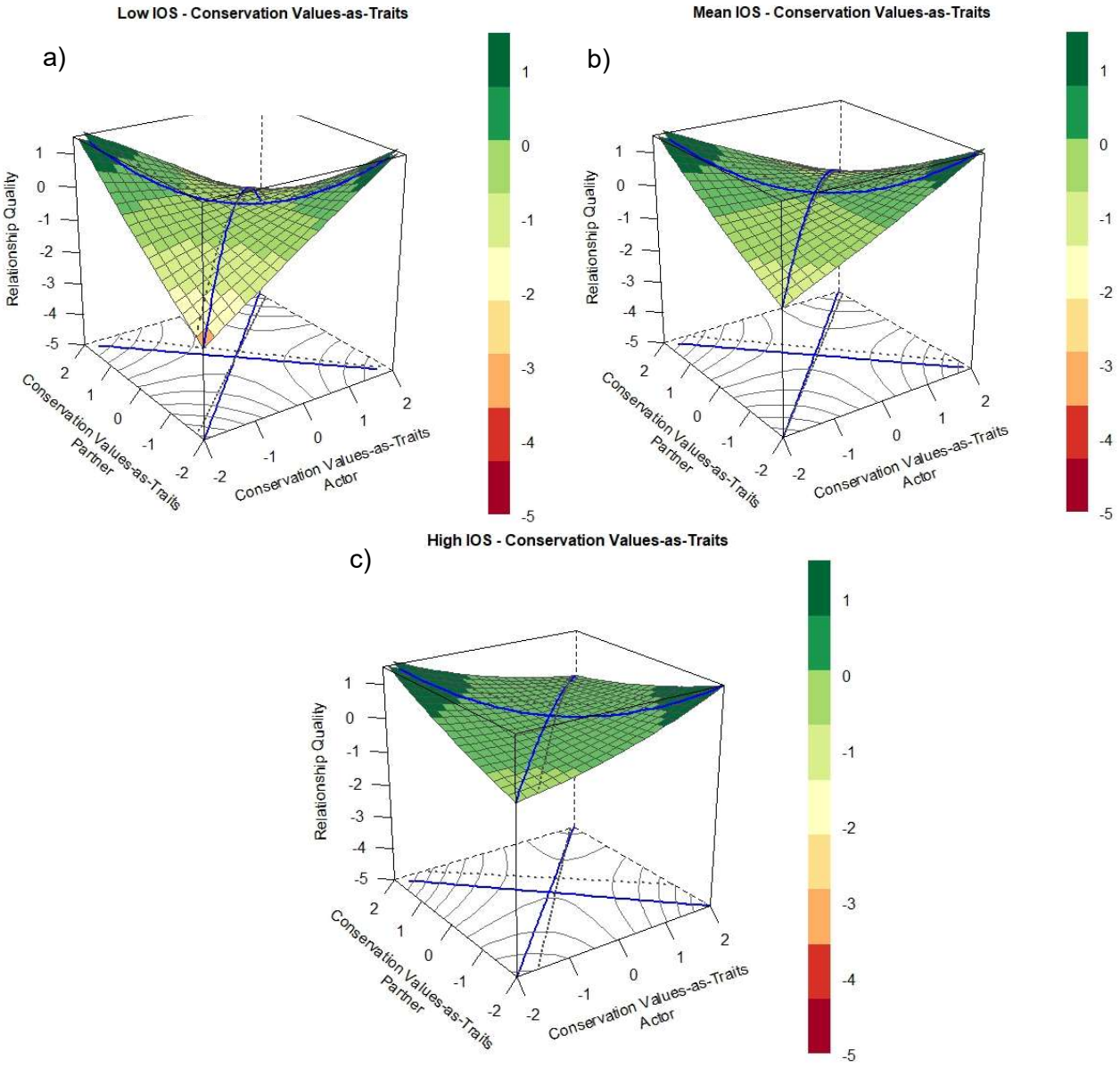
Additional polynomial regression included a moderator interacting with all five terms of the polynomial model and along with its main effect. The resulting 11-predictor model for conservation values-as-traits revealed a significant three-way interaction with the IOS (β = .14, p = .001). Using simple slopes analyses, we found that the complementarity effect was more pronounced in individuals low in IOS (β_4 = -.48, p < .001; Figure 9a), than moderate in IOS (β_4 = -.34, p < .001; Figure 9b), or high in IOS (β_4 = -.21, p = .010; Figure 9c). Thus, the dissimilarity effect was especially pronounced for partners with lower integration of the other in their self-concept. The same three-way interaction did not occur for self-transcendence values-as-traits (β = .05, p = .126), but the negative interaction persisted as the only significant regression coefficient after including IOS as a moderator (β = -.37, p = .029).

Discussion

We aimed to investigate the relative importance of romantic partners' similarity in values for their relationship quality. We obtained results in line with previous research, insofar as (with minor exceptions below) partners' similarity in values did not reliably predict relationship quality (Leikas et al., 2018; Weidmann et al., 2017). However, to test whether the motivational content and standpoint of the value and trait similarities matter, we also rephrased common value items as traits and common trait items as values (Hanel & Maio, 2020). These new measures revealed several dyadic effects, despite a methodologically conservative approach using polynomial regression analysis and total questionnaire order randomisation at every level (i.e., random order of blocks, with randomised order of instruments, with randomised order of items).

Figure 9

Response surfaces for trait conservation simple slopes parameters at varying levels of IOS



Note. Response surface a) was calculated with parameters when IOS increased by one standard deviation, surface b) was calculated using the standard parameters when IOS was included as a moderator, and surface c) was calculated with the parameters when IOS was decreased by one standard deviation.

Specifically, relationship quality was predicted by conscientiousness as a value and self-enhancement as a trait. Presumably, similarity in conscientiousness as a value predicted higher relationship quality because recoding conscientiousness as a value enabled participants to evaluate it in terms of the standards, they set for themselves and others.

Because trait conscientiousness is related to organized behaviour, such as punctuality (Back et al., 2006) or cleanliness (Jackson et al., 2010), value conscientiousness encompasses evaluations of the importance of these behaviours. Disagreeing on those standards might therefore be an enduring stressor (Solomon & Jackson, 2014), making it more difficult for the partners to coordinate their goals and resources (Fitzsimons et al., 2015). The effect of self-enhancement values-as-traits (which was also present to some extent when measured as a value) might be related to the power and wealth motives they express. Monetary issues are a cause of conflict in many relationships (Dew et al., 2012), and students (i.e., most of our participants) are a demographic in which financial worries are prevalent (Bushi, 2019). Consequently, disagreements about the value of wealth is a potential stressor. Supporting this speculation, previous research has found that similar monetary goals and values predict relationship quality (Archuleta, 2013). Alternatively, similar achievement orientations might help partners coordinate their career goals, as similarity in career goal importance has been linked to spouses' relationship satisfaction (Arránz Becker, 2013).

There were some related effects in measures of trait similarity. Couples where both partners were moderate in honesty-humility as a trait exhibited the highest relationship quality, and this effect was present to some extent when honesty-humility was measured as a value. This effect might arise because honesty-humility has been shown to negatively relate to dark triad traits (Lee & Ashton, 2005). One of these dark-triad traits, narcissism, has an interesting connection to relationship quality: it can be beneficial and detrimental to relationship quality, depending on the kind of narcissism prevalent in the individual (Back et al., 2013). Narcissistic admiration, a tendency to conduct self-assured, dominant behaviours to promote a positive view of oneself is often positively related to attraction, which might be especially important in early relationships. Wurst et al. (2017) have found narcissistic admiration to positively predict relationship satisfaction, even in long-term relationships. However, they also found narcissistic rivalry, the tendency to degrade others to protect the own self-view, to be negatively related to long-term relationship quality. Because honesty-humility might relate to both types of narcissism, the most satisfied relationship might be one with two partners of about average honest-humility.

However, there also were instances where partner dissimilarity/complementarity predicted higher relationship quality. We found a negative interaction between actor and partner in self-transcendence traits and a strong complementarity effect in conservation. Both findings were obtained only when the values were measured as traits. There is interesting similarity between the self-transcendence finding and research by Tidwell et al. (2013), who found that similarity in certain benevolence-related self-concepts is negatively

correlated with romantic liking. Using an inverse coded absolute difference score, controlling for actor and partner effects, these researchers found that being opposites in the self-characteristics “friendly/nice” and “dependable” predicted greater romantic liking after a brief speed-dating interaction. However, the researchers were hesitant in interpreting the effect, believing it to be a chance finding. Partial similarity between our sample (mostly college-age relationships), and theirs (speed dating dyads), make it plausible that the effect is common in young, less committed relationships.

It is worth noting, however, that the self-transcendence effect is not a complete effect of dissimilarity, because there were no non-linear effects on either the LOC or LOIC. Rather, it is a limited additive effect, where a partner’s self-transcendence adds more to the relationship quality of individuals low in self-transcendence than to the relationship quality of individuals high in self-transcendence. It is plausible that Tidwell et al.'s (2013) dissimilarity effect is comparable in nature to the one we have found. Replicating their methodology with trait self-transcendence, we also find a trend towards dissimilarity, b = -.14, p = .121, albeit non-significant. It is easy to see how the difference between the interaction and a full dissimilarity effect might go uncaptured without looking at the non-linear effects or the interaction term itself, highlighting the important contribution of using polynomial regression. However, the novel nature of this finding begs replication before it is interpreted further, given that dyadic personality effects on relationship quality have proven difficult to replicate with only minute changes in sample or methodology (e.g., Dyrenforth et al., 2010).

The complementarity effect in conservation values-as-traits was both robust and more nuanced. Leikas et al. (2018) reported a similar effect for value conformity, where the most satisfied partners were the most dissimilar ones (although they found no quadratic effect on the LOIC). They interpret this effect as a mismatch pattern, where couples with two low-conformity members are worst off. Our findings extend their conclusion, because we also found a significant curvature along the LOIC, showing that the most satisfied individuals are indeed polar opposites to their partner in their trait conservation. However, the significant three-way interaction with the IOS shows the effect to be strongest in less interdependent relationships. Accordingly, the effect might depend on the specific stage of the relationship. Social Penetration Theory (Taylor & Altman, 1987) suggests that similarity matters differently between people and stages of a relationship, because the topics of discourse between partners move from impersonal to personal as relationships progress. The moderating effect of IOS also aligns with evidence that that perceived trait dissimilarity is especially beneficial for relationship satisfaction in low-commitment relationships (Amodio & Showers, 2005). Amodio and Showers (2005) argue that the dominant motivation for such

relationships is self-expansion, while people in high-commitment relationships are motivated to achieve stability. With the comparatively young couples of our sample, most of their relationships are likely to be comparatively low in commitment. While this might explain why we find this strong effect of dissimilarity, future research should replicate the effect in a different sample to add weight to this conclusion.

Lastly, an interesting question pertains to the influence of gender. Previous studies have reported similarity effects that vary by gender, but with inconsistent findings (Decuyper et al., 2012; Leikas et al., 2018; Luo & Klohnen, 2005; Robins et al., 2000) . Therefore, our aim was to investigate the general role of personality similarity instead of splitting by gender. We nevertheless conducted a post-hoc analysis of moderation by gender. As recommended by Kenny and Kashy (2015), we included gender as a moderator on all dimensions with significant dyadic effects. No significant three-way interactions emerged. As described in the supplementary materials, the obtained effects applied to some extent among both men and women.

Limitations

One limitation of the current study is its cross-sectional nature, which did not allow us to examine the causal direction underpinning the polynomial effects of values on relationship quality. Most research and theory assume that individual differences like values and traits shape relationship quality because these dispositions are enduring vulnerabilities that moderate the impact of stressful events (Karney & Bradbury, 1995). However, some research has also found that relationship quality might have an impact on personality. For example, research has found that the first relationship experience can lead to a quicker maturation of personality, manifesting (for example) in a decrease in neuroticism (Neyer & Lehnart, 2007; Robins et al., 2002). However, no longitudinal study has examined the causal connection between values and relationship quality.

Second, the design of the SSVS did not allow us to look at effects of more specific value types (e.g., universalism, benevolence, security), which is preferable to solely looking at the higher-order value types. For example, self-transcendent values and traits can be further subdivided into a value type, universalism, focused on concern for the welfare of nature and larger society, and a value type, benevolence, focused on concern for the welfare of close others (Schwartz, 2012). Arguably, different results may arise for these two value types in the context of relationships, considering the conceptual closeness of benevolence to the self-characteristic used by Tidwell et al. (2013).

Finally, IOS data alone are not sufficient for testing the merits of the self-expansion – commitment explanation. Although the IOS can be used as a stand-in for commitment, it does not assess commitment alone. It relates to interpersonal closeness and a melding of self-concepts (Aron et al., 1991). Rather than being a facet of commitment, cognitive interdependence works in tandem with commitment. If commitment is about intending to persist in the relationship, envisioning a common future, and feeling emotionally attached to the relationship, cognitive interdependence is a necessary consequence or antecedent of it (Agnew et al., 1998). For such a test, a more direct measure of commitment would be needed.

Conclusion

Our research replicated previous findings of (next to) no effects of (dis)similarity when value and traits were assessed in the usual manner. However, when we measured traits-as-values and values-as-traits, the evidence revealed that relationship quality is enhanced by similarity in some dimensions (e.g. value conscientiousness), and complementarity in others (e.g. trait conservation). Together, this evidence indicates that, in romantic relationships, it is likely the case that “birds-of-a-feather flock together” and “opposites attract”, but the occurrence of each process depends on which motives are considered and the psychological standpoint from which they are measured.

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Academic Paper 2: The Importance of Trait Benevolence for Romantic Relationships: An Eight-Month Longitudinal Study

Pretext

Academic Paper 1 presented several novel findings regarding the importance of personality congruence between partners in romantic relationships. Beyond interesting effects in individual dimensions, there was a trend for congruency to matter when values were recast as traits (as with the self-transcendence and conservation complementarity effects) and when traits were recast as values (as with the conscientiousness similarity effect). Notwithstanding the conservative conditions under which these effects were obtained (complete randomisation of items within instruments, polynomial regression analysis), past research has shown how notoriously difficult to replicate congruence effects are. Replication failures have been observed after slight changes in the method of personality measurement (Dyrenforth et al., 2010), the method of relationship quality measurement (Barelds & Barelds-Dijkstra, 2007), or sample composition (Shiota & Levenson, 2007; Zhou et al., 2017). Therefore, I preregistered (osf.io/g8xqy) a second study, with the aims of (1) ensuring the replicability of these newly obtained findings, (2) demonstrating their independence from the method of personality measurement, and (3) presenting the first cross-lagged analysis of values and relationship quality over time. To meet these aims this second study was set to be a longitudinal study, recording data from participating couples at three points over a period of eight months.

For the second study, I needed to choose whether I wanted to follow-up the effects found in the measure with value content, or the effect found in the measure with trait content. This choice was necessary because of the extensive time it takes participants to complete longer, more reliable value or trait questionnaires. Measuring both values and traits in both their standard forms and rephrased in the opposite standpoint (i.e., traits and values respectively), all with long-form measures would potentially lead to low data quality and higher drop-out rates between waves in the longitudinal study (Galesic & Bosnjak, 2009).

I ultimately decided to focus on the complementarity effects found in self-transcendence and conservation values-as-traits, rather than the similarity effect in conscientiousness traits-as-values. There were three main reasons for this decision. First, the complementarity effect of self-transcendence values-as-traits seemed most counter-intuitive. Previous research showed self-transcendence to be highly related to agreeableness (Anglim et al., 2017; Parks-Leduc et al., 2015), and to positively relate to relationship quality through intrinsic pro-relationship motivation (van der Wal et al., 2020). I would thus have assumed there to be an additive effect, where more self-transcendence

(regardless from whom it might come) was always related to more relationship quality. However, my first study was not the first reported case of a positive effect of dissimilarity in self-transcendent traits. There was also Tidwell et al.'s (2013) puzzling finding of dissimilarity in self-transcendent traits (i.e., being “friendly/nice” and “dependable/trustworthy”) showing a positive connection to romantic liking in speed daters. Given that both our samples were comprised of younger couples, showing the true and robust nature of the trait self-transcendence complementarity effect became an aim of the longitudinal investigation. This was another reason as to why I decided that the second sample should be similar in composition to that recruited for Academic Paper 1.

Second, the conservation values-as-traits complementarity effect explained the most variance in relationship quality in the first sample by a wide margin (R^2 = .19; of course, this includes the associated actor and partner effects). Additionally, the robust-seeming three-way interaction with the IOS (Aron et al., 1992) might have delivered an explanation why congruence effects appear in certain studies, but not in others, as they depend on the degree to which a relationship has progressed (i.e., the partner has been included in one’s own self-concept). While there have been no previous observations of similar effects in conservation values, the aim of finding evidence for the conditions under which this congruence effect was likely to arise became another aim of the second study (of course, all assuming I was able to replicate the conservation complementarity effect).

Lastly, beyond focusing on congruence effects, the second study would also present an opportunity for a longitudinal study of the influence of personality on relationship quality. However, while studies on the longitudinal effects of traits on relationship quality exist plentiful (Karney & Bradbury, 1995; Robins et al., 2002; Solomon & Jackson, 2014; Weidmann, Ledermann, et al., 2017; Weidmann, Schönbrodt, et al., 2017), there have been no studies on values predicting future changes in relationship quality. Because the questionnaire needed to be short, choosing motivational content with a proven cross-sectional association to relationship quality (like self-transcendence; van der Wal et al., 2020), alongside one with a less-consistent association to relationship quality (i.e., conservation) seemed like a fruitful approach to a first investigation and comparison of the strengths of bottom-up (i.e., values-relationship quality) and top-down (i.e., relationship quality-values) causal pathways.

In sum, the second study served the three aims of (cross-sectionally and longitudinally) replicating the findings obtained in the first study, showing the findings’ independence of methodology, and presenting the first longitudinal, causal investigation of the connection between values and relationship quality. Because adding items measuring

conscientiousness traits and traits-as-values would have prolonged the questionnaire, thus worsening data-quality and increasing drop-out, and detracted from the clear value-focus of the second study, I only included values and values-as-traits with self-transcendent and conservation content in the second investigation.

The Importance of Benevolence for Romantic Relationships: An Eight-Month Longitudinal Study

Lukas F. Litzellachner[1], Paul H. P. Hanel[1,2], Bas Verplanken[1], & Gregory R. Maio[1]

[1]Department of Psychology, University of Bath, Bath, United Kingdom

[2]Department of Psychology, University of Essex, Colchester, United Kingdom

* Please address correspondence to Lukas Litzellachner, Department of Psychology, University of Bath, Claverton Down, BA2 7AY Bath, United Kingdom: l.f.litzellachner@bath.ac.uk

Author's contributions: Conceptualized: LL PH GM; Designed the study: LL PH BV GM; Data analyses: LL; Visualizations: LL; Wrote original draft: LL PH BV GM; Wrote revised draft: LL PH BV GM

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Abstract

Previous research has found that self-transcendence values and conservation values positively relate to relationship quality. These recent findings also highlight the importance of partner complementarity in both of these value types, especially participants are asked about how frequently they perform behaviours implied by these values (i.e., measuring the values-as-traits; Hanel & Maio, 2020). However, the notoriously elusive nature of congruence effects in dyads necessitates replication of these effects, alongside a need to examine their putative causal directions over time. Accordingly, this longitudinal study re-examined the effects of complementarity in self-transcendence and conservation with a new sample and rigorous methodology, while conducting the first longitudinal examination of the associations between values and relationship quality. A sample of 148 romantic couples completed measures of values, values-as-traits, and relationship quality in three waves over 8 months. Polynomial regression analyses of the first-wave data affirmed our preregistered (osf.io/g8xqy) predictions that complementarity in self-transcendence (specifically, benevolence) values-as-traits was positively related to relationship quality. Our longitudinal analysis also provided stronger evidence for self-transcendence values influencing future relationship functioning than vice versa. We interpret these findings in the context of long-standing theory about communal relationship orientation and interdependence.

The quest to find a stable relationship is among the most important life goals that people pursue (Roberts et al., 2004; Roberts & Robins, 2000). The romantic ideal of identifying a romantic partner to complement oneself is a centrepiece of romantic life. Accordingly, much focus has been placed on similarity as important for relationship functioning. People say that it is vital that their partner shares their values, and this belief about the importance of shared values is common in dating websites (e.g., eHarmony; Buckwalter et al., 2009). Meanwhile, many situations might best be suited for couples that are complementary, where dissimilar goals or behaviours lead to the best outcomes for the relationship. Additionally, there remains ambiguity about the extent to which partners' values and their value-relevant traits play a causal role in determining relationship quality and about the distinctiveness of these roles. This research addresses these issues through a new longitudinal study of couples.

This research focuses on three issues. First, building on past evidence (Litzellachner et al., 2020; van der Wal et al., 2020), we simultaneously consider the longitudinal effects of self-transcendence values (i.e., promoting the benefit of others, including the benevolent dispositions referred to above) and conservation values (i.e., promoting self-restraint for the safety and stability of oneself, one's close environment, and society; Schwartz, 1992) on relationship quality. Second, we consider the simple effects of such values together with the effects of partner congruence in values on relationship quality. Third, based on recent findings (Hanel & Maio, 2020; Litzellachner et al., 2020), we argue that it makes a difference whether someone believes in the importance of a value or whether they express this value as a stable behavioural disposition. That is, the same motivational content (e.g., self-transcendence) can have a different role in the relationship when conceived as a value than when conceived as a trait.

Values, Value Content, and Relationship Quality

People's behaviours and decisions are guided by their personal values (Bardi & Schwartz, 2003; Luo, 2009) - abstract guiding principles that have importance in their lives (Schwartz, 1992, 2012). Numerous studies have obtained evidence that values subsume two dimensions of motivational content (see Maio, 2017; Schwartz et al., 2012). The first dimension of Schwartz's (1992) circumplex model, contrasts the higher-order value type of self-transcendence with the higher-order value type of self-enhancement, which express the motivation to enhance one's own welfare. The second-dimension contrasts the higher-order value type of conservation with the higher-order value type of openness, which express the motivation to seek novel sensations, pleasure, and freedom (Schwartz, 1992; Schwartz et al., 2012). Each higher-order value type can be further split into multiple value types, such as universalism (i.e., enhancing the welfare of all people and nature) and benevolence

(enhancing the welfare of those close to oneself) for self-transcendence, and tradition (i.e., preserving customs and ideas provided by culture or religion), conformity (i.e., avoiding to hurt others or violate social rules), and security (i.e., safety and stability for oneself and society) for conservation (Schwartz et al., 2012). Each of these value types is comprised of a multitude of specific values (e.g., equality, creativity, success), which are often represented by the individual items in instruments measuring values. The structure has been replicated across over 80 countries and several distinct methods (e.g., Coelho et al., 2019; Schwartz et al., 2012).

Values also play a role in how people experience their relationships. For instance, self-transcendence values are positively associated with relationship quality (van der Wal et al., 2020). Furthermore, there is evidence that this connection of self-transcendence values to relationship quality is mediated by an intrinsic motivation for being in the relationship and higher communal strength (i.e., the degree of responsibility felt by one partner to be responsive to the other partner's needs). This indirect connection of self-transcendent values to relationship quality through benevolent relationship behaviours is evidence for the pivotal role of benevolence in romantic relationships.

Almost every specific benevolence value theoretically exerts a positive influence on relationship quality. For example, *helpfulness* (i.e., being prosocial) has been theorised to signal evolutionary mate value (Miller, 2007), predicting an individual's desirability (Stavrova & Ehlebracht, 2015). According to the eudaimonic theory of marital quality (Fowers & Owenz, 2010), promoting *a meaningful life* and pursuing *true friendship* reflect two necessities for high-quality romantic relationships. Similarly, being seen as *responsible* by one's partner relates to being trusted (Rempel et al., 1985), which is a central component of relationship quality (Fletcher et al., 2000), and *honesty* lessens the impact of having one's undesirable behaviour discovered by one's partner (Resch & Alderson, 2014; Zhang & Stafford, 2008). Also, *loyalty* is stated as a constructive (rather than destructive) response in Rusbult et al.'s (1982) categorization of responses to perceived relationship decline, and *forgiving* the partner for transgressions, rather than dwelling on the issue or enacting vengeful behaviours, relates to higher relationship quality after marital conflicts (McNulty, 2008; Paleari et al., 2005). Lastly, *mature love* is a self-transcendent form of unconditional love, being responsive to the partner's needs without expecting anything in return (T. N. Le, 2005; T. N. Le & Levenson, 2005).

Conservation values might also relate to relationship functioning. Conformity values pertain to self-restraint and sacrifice in order to avoid upsetting or hurting close others. While conformity and benevolence values share a common focus on close others,

conformity motivates forsaking one's own needs to prevent a pleasant situation (or relationship) from deteriorating (Schwartz, 1992). Meanwhile, benevolence values motivate forsaking one's own needs to proactively enhance the partner's welfare. Another relevant conservation value is security. People who value security care about safety and stability for themselves, their relationships, and society. Security values are similar to conformity values, in that they motivate prosocial action for the sake of preventing the relationship from deteriorating, rather than to enhance the partner's welfare (like benevolent values would do). Ironically, if these values primarily focus on protecting relationships though conflict avoidance, they may diminish relationship quality (Impett et al., 2005). In contrast, if these values focus on protecting relationships through conscientious self-discipline and orderliness (Parks-Leduc et al., 2015), they may enhance relationship quality (Schaffhuser et al., 2014).

However, dyadic findings about whether congruence (i.e., similarity or complementarity) in personal values matters are more complex. Some previous studies suggest that partners with similar values have more satisfied relationships (Gaunt, 2006; Luo et al., 2008; Luo & Klohnen, 2005). The complicating factor is that such findings are often obtained using different methods for operationalizing similarity. Two prominent methods are difference scores (Gaunt, 2006) and profile correlation (Luo et al., 2008; Luo & Klohnen, 2005). When computing difference scores, researchers calculate the (algebraic, absolute, or quadratic) difference between the score of a person (i.e., the actor) and their partner. When computing profile correlations, researchers operationalise similarity as the degree of dependence between actor and partner answers across a set of questions, by calculating measures of correlation, such as Pearson's r. Both difference score and profile correlation methods are problematic (J. R. Edwards, 1993, 2001). They reduce the fundamentally three-dimensional nature of congruence effects (actor values, partner values, and relationship quality) to a two-dimensional one (difference/profile correlation and relationship quality). As a result, neither method can detect at which level of the predictor (e.g., at high or low importance ratings of a value) similarity matters most. In addition, difference scores might confuse a similarity effect with mere actor or partner effects, while profile correlations combine a heterogenous set of constructs into one single measure, making interpretation difficult and removing the capacity to detect congruency effects for particular values (because comparisons are made across attributes within people).

In response to these shortcomings, J. R. Edwards (2002) recommended the use of alternative methods that recognise and integrate the three-dimensional nature of congruence hypotheses, namely polynomial regression and response surface analysis (RSA). To preserve the three-dimensional structure, these methods allow both partners' attributes to

predict an outcome independently. Similarity at any dimension can be investigated separately by looking at the interaction between both partners' scores in that dimension, without the need to compute profile indices. Polynomial regression also models the quadratic effects of both actor and partner scores, allowing more detailed analysis showing the level at which similarity might matter most. Ignoring quadratic effects might lead to confusing latent quadratic effects (i.e. individual quadratic actor/partner effects) for an interaction (i.e., a congruence effect).

Unlike previous studies of value similarity, a recent study using polynomial regression hardly found any effects of value congruence on relationship satisfaction (Leikas et al., 2018). Analysing a dyadic sample recruited at a child health clinic, the researchers reported a small similarity effect in self-direction, but no congruence effects in any other values. This lack of effects included benevolence values, for which they only found significant actor effects and a quadratic partner effect. However, some limitations of the study make it unwise to draw conclusions from the null effects regarding value similarity, despite the added methodological rigor of polynomial regression. For example, the authors themselves questioned the representative nature of their result beyond their demographic of (expecting) parents, who may be highly committed to their relationships, thus limiting the observed variance in relationship quality. Furthermore, relationship quality was assessed on a single "satisfaction" item, lowering reliability and oversimplifying this inherently multidimensional construct (Fletcher et al., 2000). Thus, the extent to which the findings generalise to less-committed relationships and broader definitions of relationship quality remains to be seen.

Another limitation of Leikas et al.'s (2018) analysis and other previous work is that the mechanism for the role value similarity is still unclear. Hanel and Maio (2020) have shown that the motivational content represented by values can be investigated as both values and as values-as-traits. The values-as-traits method asks participants about the degree to which the behaviour implied by the values describes them. Using this method, the researchers were able to show that values-as-traits explained variance above values in satisfaction with life and various cognitive outcomes (e.g., facets of mindfulness). In theory, this added variance is attributable to the behavioural manifestation of values in people's lives, over and above the role of values to their social attention, perception, and cognition. Applied to relationships, any role for values-as-traits would similarly indicate that it is the behavioural manifestation of the values in the relationships that matter, and not merely the abstract intentions and motivations that the values per se express.

Recently, another study (Litzellachner et al., 2020) examined the role of value similarity in relationship quality. Among other measures, participants completed measures

of values, values-as-traits, and relationship quality. Polynomial regression analysis and RSA replicated the null-effects for value similarity found by Leikas et al. (2018) but revealed a complementarity effect when asking about self-transcendent values-as-traits. That is, having a partner high in trait self-transcendence was more beneficial to people comparatively low in trait self-transcendence themselves than to those who were high in this trait. However, this previous study also had the limitation of using less reliable short-form instruments to measure values and values-as-traits (the short Schwarz Value Survey; Lindeman & Verkasalo, 2005), which makes it impossible to detect whether the self-transcendence complementarity effect was truly caused by benevolence (rather than universalism).

Evidence for the importance of complementarity in benevolence can also be found in an earlier investigation of romantic liking in a sample of speed-daters (Tidwell et al., 2013). Romantic liking of the speed-dating partner was analysed after a short interaction in relation to actual similarity in 14 self-characteristics (e.g.: “ambitious”, “funny”) and the Big Five personality traits (Donnellan et al., 2006; Goldberg, 1990). Against their expectations, the researchers found dissimilarity in two specific self-characteristics, “dependable/trustworthy” and “friendly/nice”, to positively predict romantic liking. Their analysis showed no other dyadic effects. Consequently, Tidwell et al. (2013) believed the dissimilarity effects to be artefactual results of random chance and did not interpret them. However, the more recent evidence regarding the self-transcendence complementarity effect suggests that Tidwell et al.'s (2013) finding warrants replication and extension.

But why would there be a complementarity effect in trait self-transcendence/benevolence from a theoretical standpoint? From prior evidence, the benevolence of a person and the benevolence of their partner should independently and positively predict relationship quality. For example, a study by Kumashiro et al. (2002) showed that each relationship partner’s prosocial behaviours are independently related to couple wellbeing. A similar effect arises when looking at the Big Five dimension of agreeableness, which overlaps with benevolence in motivational content to some extent (Parks-Leduc et al., 2015). Two polynomial regression studies report significant positive additive effects of being agreeable and having an agreeable partner on relationship satisfaction (Leikas et al., 2018; Weidmann, Schönbrodt, et al., 2017). Nevertheless, benevolence and agreeableness are also distinct, because benevolence additionally represents an intrinsic striving for honest intimacy (e.g., “true friendship”, “mature love”), which is absent from traditional conceptualisations of agreeableness (Ashton et al., 2004; DeYoung et al., 2007). This difference in content might be responsible for the more complex association of trait benevolence with relationship quality.

The Causal Direction: Bottom-Up or Top-Down?

A related issue concerns whether values and/or values-as-traits cause changes in relationship quality in the first place, or whether changes in values and/or values-as-traits are caused by relationship quality. Researchers tended to assume that individual differences predict relationship quality; that is, individual dispositions causally influence phenomena beyond the individual, at the higher level of the dyad, causing changes in relationship quality bottom-up. For example, the vulnerability-stress-adaptation model (Karney & Bradbury, 1995) states that many personality traits (such as negative affectivity, or neuroticism) are enduring vulnerabilities. On one hand, the presence of problematic traits might lead to partner's behaving in ways that might create additional relationship conflict or increase the impact of stressful situations on couples. On the other hand, certain aspects of personality (such as agreeableness) might also help the partners adapt and learn from past mistakes. Supporting this notion, several longitudinal studies showed that Big Five traits (specifically, emotional stability, agreeableness, conscientiousness, and extraversion), predict future states of relationship satisfaction (Karney & Bradbury, 1995), or changes in relationship satisfaction (Robins et al., 2002; Solomon & Jackson, 2014; Weidmann, Ledermann, et al., 2017; Weidmann, Schönbrodt, et al., 2017). Nonetheless, analogous tests have yet to be applied to understanding the role of values and of their manifestations in traits.

Such tests are important because prior evidence shows that individual differences might also be affected by earlier relationship quality. This top-down influence might be particularly evident in young years, where personality changes are more common than in adulthood (Roberts & DelVecchio, 2000; Robins et al., 2002). Forming and maintaining relationships can lead to faster maturation of personality in young individuals, leading to decreases in neuroticism or negative affectivity (Neyer & Lehnart, 2007; Robins et al., 2002). High-quality relationships also sculpt individuals' personalities towards their ideal versions of themselves, which is known as the Michelangelo phenomenon (Drigotas et al., 1999). This process has been found in diverse age groups (Bühler et al., 2019), showing that changes in personality as a consequence of relationship quality can happen at all points in life.

Despite these findings, accumulated evidence indicates that the bottom-up pathway may be stronger. The relative strength of the longitudinal bottom-up pathway, relative to the strength of the top-down pathway for traits has been shown in several studies (Deventer et al., 2019; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007). Also, many traits (as discussed above) predict changes in marital quality, while relationship quality only weakly predicts changes in neuroticism (Neyer & Lehnart, 2007; Roberts & Chapman, 2000; Robins et al., 2002). In fact, individuals tend to show similar patterns of behaviour in relationships

with different partners over time, showing little change in personality even after the end of a negative relationship (Robins et al., 2002).

Like personality traits, values are relatively stable over long periods of time (Vecchione et al., 2016). Because people are likely to experience multiple relationships with all their ups and downs while values remain stable, the connection of values to relationship quality may also be bottom-up rather than top-down. Nevertheless, there is a lack of longitudinal research into values and relationship quality. The most relevant, indirect evidence for the superiority of the bottom-up over the top-down pathway for values was obtained in three longitudinal studies of major life changes (Bardi et al., 2014). Participants answered value questionnaires at the beginning of a major life transition and several months later. Despite different life transitions across samples, there was more evidence for the individuals' values predicting self-selection into the life transition (bottom-up) than for the life transition predicting change in the individuals' values (top-down). Coupled with the stable nature of values compared with relationship quality, it is plausible that values are more likely to influence relationship quality than vice versa. However, because no research to date has investigated whether intrapersonal values can be the shaped by the quality of a romantic relationship, this study will test both directions of effects using a longitudinal approach.

The Current Study

In the present research, we focused on reliable measures of self-transcendence and conservation values and values-as-traits, due to the previous evidence showing complementarity effects in these dimensions when worded as traits, alongside no congruency effects (or weaker effects) for other values (Leikas et al., 2018; Litzellachner et al., 2020; Tidwell et al., 2013). To address the gaps in understanding the causal roles of these specific values in relationship quality, our design examined how changes in the values predict relationship quality across three waves over a duration of eight months.

We had two principal aims. The first aim was described in our pre-registration of the study (osf.io/g8xqy). This aim was to replicate the novel finding of a self-transcendence complementarity effect, using cross-sectional analyses within a dyadic dataset. This is especially important given past failures to replicate similarity effects even with similar samples and only slight differences in methodology (e.g., Dyrenforth et al., 2010). We set out to meet this aim by obtaining self-report data on the values and the values-as-traits from both partners at all measurement times. With the primary focus on replicating the effect cross-sectionally (preferably in the first wave, where power is maximised), replicating the effect internally would demonstrate its robustness and importance to couples at all stages of relationships. Because earlier research also observed a complementarity effect in

conservation values, we also tested whether this finding replicates before interpreting it further. Thus, we hypothesised (H1) that there will be complementarity effects in both self-transcendence and conservation. Based on previous findings, we further predicted (H2) that the complementarity effects in these cross-sectional analyses would be stronger for the values-as-traits than for the values themselves.

The second aim was to present the first longitudinal exploration of the causal directionality of the connections between values and relationship quality. This important exploratory aspect of the design enabled us to test whether some values predict relationship quality longitudinally or are predicted by relationship quality. In our view, there was a theoretically stronger case for the supremacy of the bottom-up causal pathway, but both pathways are viable, and their relative strength is an issue that requires evidence. In the longitudinal analyses, we were interested in only the direct simple effects of the values and values-as-traits, as we are not aware of a robust methodological precedent for modelling causal dyadic similarity effects over time.

Method

Participants

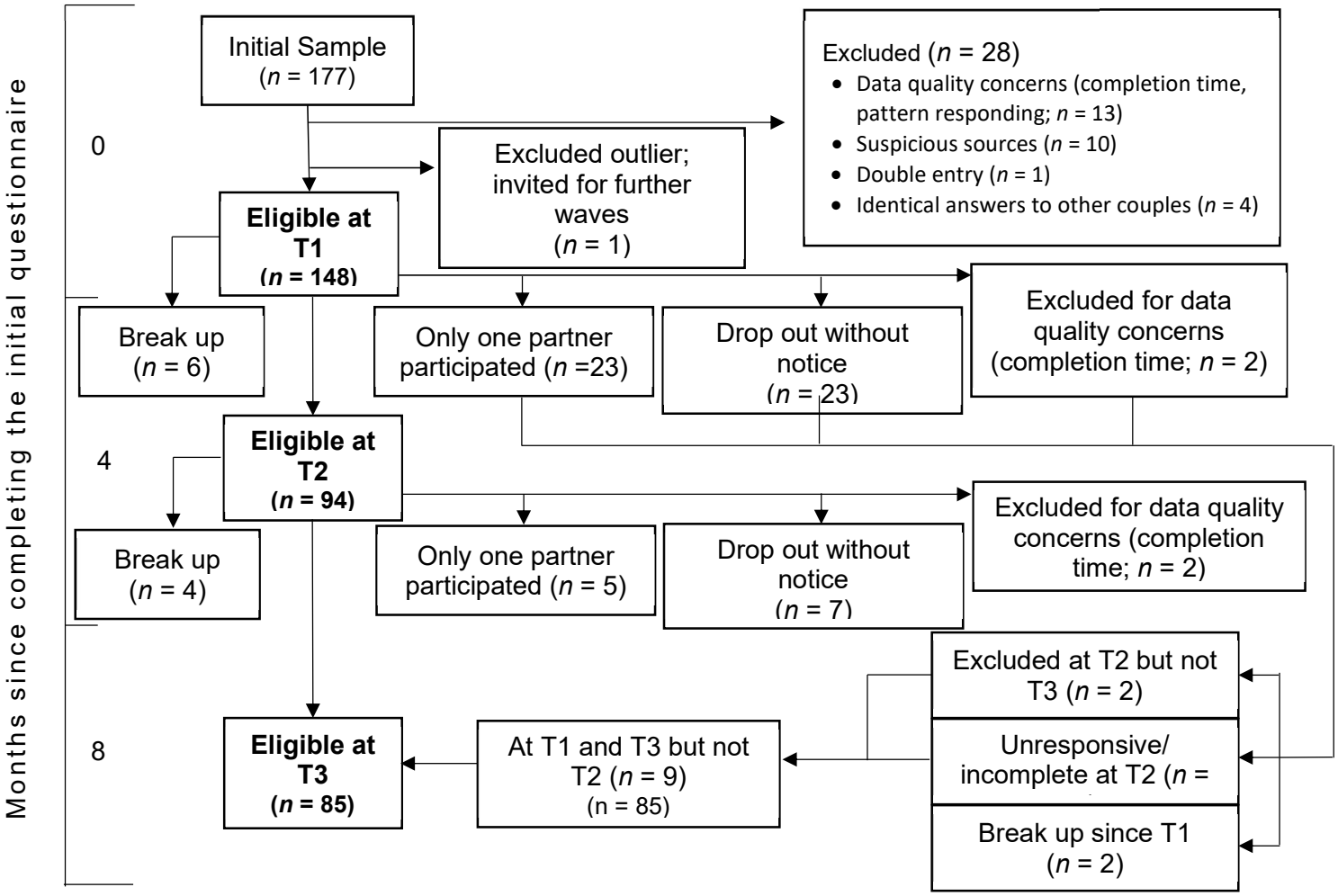
Participation included three waves. We recruited an initial sample of 177 couples (354 individuals) in romantic relationships for at least three months. Couples were matched through anonymous participant codes, which they generated by answering questions about themselves and their partner. These codes were also used to match individuals and partners across the waves. Two-thirds of the valid sample for the wave 1 analysis (N = 148 couples; reasons for exclusions and sample development, see Figure 10) were students (66%, 150 female, 143 male, 1 other gender; M_{age} = 23.61, SD_{age} = 6.38), and the average relationship duration was 35.83 months (SD = 43.04). The initial sample comprised mostly heterosexual (N = 140, 95%), dating (N = 134, 91%), non-cohabiting (N = 90, 61%) relationships.

Power calculations were performed beforehand using G*Power (Faul et al., 2007). The sample of eligible couples at the first measurement point (T1) was large enough for obtaining a medium sized effect (f^2 = .15) for a single regression coefficient in five-predictor multiple linear regression (i.e., a polynomial regression model) with 80% power at the Bonferroni corrected significance level (corrected α = .005 for 10 tests because there were 2 x 5 predictors without explicit hypotheses), taking into account 20% drop-out over 8-months. (The actual sample size for this rate of attrition would be 94 couples at T3.)

As compensation, both members of a couple received a £1 Amazon voucher after completing the first questionnaire. They received an additional £2 and a £4 voucher after finishing the second and third questionnaire (after 4 and 8 months) respectively. Participants were informed they would receive this compensation even if they told us at the point of measurement that their relationship had ended. For each wave, their rewards were provided

Figure 10

Flowchart of the number of couples in the sample throughout the data collection period



Note. The *n*s refer to the number of couples at each point. Participants were excluded for completion time issues, if they took less than 10 minutes to complete the questionnaire. Pattern responding, identical answering, and double entries were identified through visual inspection of answers, participant codes, and e-mail addresses. The participants deemed suspicious completed the questionnaire in rapid succession, their e-mail addresses all followed the same schema of [*firstname].[lastname][numbers]@gmail.com,* and the names depicted in the e-mails never matched the participant codes. In the case of a double entry, only the later entry was excluded. The extreme outlier at T1 was 7 SDs below the mean in value and trait benevolence, but only at T1.

after both partners had completed the session. If the relationship had ended, only one person needed to complete the measures.

Materials

Table 7 shows the descriptive statistics for all variables in the analyses at all waves.

Values. Respondents rated 18 self-transcendence and 16 conservation values from the Schwartz Value Survey (SVS; Schwartz, 1992) in terms of their importance *as guiding principles in the participant's lives*. These value items included all five value types (i.e., universalism, benevolence, conformity, tradition, and security) from within the self-transcendence and conservation domains. For each rating, the SVS presents respondents with an abstract ideal or outcome (e.g., "Equality") accompanied by a brief description (e.g., "equal opportunity for all"). To keep the shape of the scale consistent with the Values-as-Traits scale (below), the response scale ranged from "Extremely opposed to my values" (-5) to "Extremely Important" (5). Across all three time points, the internal consistencies for all five lower order value types (i.e., universalism, benevolence, conformity, tradition, and

Table 7

Descriptive statistics in all waves

		SVS							SVS-T							
		UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON	RQ
	M	2.80	3.02	2.34	0.70	2.47	2.91	1.89	2.17	2.69	2.36	0.46	1.98	2.43	1.60	7.01
T1	***SD***	1.06	0.92	1.38	1.63	1.07	0.88	1.13	1.24	0.98	1.39	1.60	1.26	0.97	1.18	0.73
	α	.77	.75	.70	.64	.69	.84	.84	.79	.76	.64	.53	.68	.84	.82	.93
	M	2.88	2.96	1.97	0.78	2.58	2.92	1.86	2.21	2.70	2.37	0.51	2.00	2.46	1.63	6.91
T2	***SD***	1.05	0.87	1.50	1.63	1.09	0.88	1.22	1.11	0.92	1.37	1.65	1.17	0.92	1.17	0.77
	α	.80	.73	.66	.68	.71	.86	.87	.75	.71	.63	.64	.61	.82	.82	.94
	M	2.84	2.97	2.03	0.76	2.59	2.91	1.88	2.33	2.71	2.41	0.59	2.12	2.52	1.71	6.82
T3	***SD***	0.98	.88	1.34	1.70	1.08	0.82	1.19	1.08	0.98	1.29	1.65	1.24	0.91	1.18	0.86
	α	.78	.75	.61	.72	.71	.85	.86	.78	.73	.64	.62	.70	.84	.84	.95

Note. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, RQ = relationship quality, SVS = values, SVS-T = values-as-traits

security) were adequate to good, while the two higher order self-transcendence and conservation value domains both possessed good internal consistency.

Values-as-Traits. Following Hanel and Maio (2020), we reworded the value items of the SVS to ask about behavioural tendencies, rather than abstract ideals, to measure values-as-traits (SVS-T). Participants were asked to (dis)agree with these behavioural descriptions on whether they were descriptive of themselves. The response scale ranged from “Extremely opposed to my values” (-5) to “Extremely Important” (5)For items the sole exception of tradition traits at T1 (α = .53), all reliabilities for the lower order values-as-traits were adequate to good at all three points. The higher order self-transcendent and conservation values-as-traits both exhibited very good internal consistency at all three points (see Table 7).

Relationship Quality. Respondents reported their relationship quality using the 18-items of the Perceived Relationship Quality Component scale (PRQC; Fletcher et al., 2000). Example items are “How satisfied are you with your relationship?”, and “How much do you trust your partner?”. Participants responded on an 8-point scale ranging from “Not at all” (1) to “Extremely” (8), with no points labelled between these endpoints. The PRQC maintained excellent reliability throughout the three waves (see Table 7).

Commitment. We assessed relationship commitment using Lund's (1985) 10-item measure. Example items are “How likely is it that your relationship will be permanent?” and “How much trouble would ending your relationship be to you personally?” Participants responded using a 7-point scale, with the labels varying according to the item (e.g., from 1 “Extremely unlikely” to 7 “Extremely likely”). Analyses of internal consistency led us to exclude one item (“How obligated do you feel to continue this relationship?”). After excluding this item, the commitment score had good internal consistency at all points of measurement (T1: α = .80, M = 5.98, SD = 0.73; T2: α = .80, M = 5.97, SD = 0.67; T3: α = .80, M = 6.00, SD = 0.70).

Other Measures. The survey also included a single-item measure of happiness and a single-item asking respondents about how much they are willing to invest in their relationship in the future. Both items were taken from the Dyadic Adjustment scale (Spanier, 1976). Participants also completed the single-item Inclusion-of-the-other-in-the-self-scale (IOS; Aron et al., 1992). These measures of relationship quality were included to make the findings comparable to Leikas et al. (2018), who used a single-item relationship quality measure as their outcome variable, and Litzellachner et al., (2020), who used the future investment item of the dyadic adjustment scale and the IOS as indicators of commitment.

Each questionnaire also included a 30-item measure of relationship ideals (Fletcher et al., 1999), an instructed-response attention check item[4] (Kung et al., 2018; "For this question, select the second answer from the left"), and six items assessing respondents' perceived similarity to their partners in values, traits, and romantic ideals (two items each). The third questionnaire also included the short (eight-item) Positive and Negative Relationship Quality Questionnaire (PNRQ; Fincham & Rogge, 2010). The ideals scale, perceived similarity items, and the PNRQ were included to be analysed in other projects and are not described in detail here.

Procedure

Respondents were invited to participate if their relationship had lasted more than three months at the beginning of T1. To keep respondents engaged with the study between waves, we sent them a short reminder one month before their next participation was due. These e-mails reminded respondents about the importance of the study and their participation, while providing them with one article about relationship science from www.luvze.com (before T2: Dowlat, 2018; before T3: Lewandowski, 2015). Participants were asked to report whether or not they had read the article at the beginning of the successive questionnaire. After receiving information about the study and giving informed consent, respondents generated participant codes for themselves and their partner. At T2 and T3, participants were also asked whether they were still in the same relationship as they were at T1 and whether they had read the article.

Respondents would then randomly see either the "predictor block" (SVS, Values-as-Traits, Relationship Ideals, and perceived similarity measures) or the "outcome block" (PRQC, Commitment measure, DAS items, IOS, and PNRQ), followed by the other block. For each participant, the order of the instruments within each block was also randomised (apart from the perceived similarity measures, which always followed the relevant self-rating measure), and so was the order of items within each instrument. After completing both the "predictor block" and the "outcome block", respondents responded to demographic questions (age, gender) and descriptive questions about their relationship (duration, marriage status, children). For respondents who indicated that they were married, the questionnaire included

[4] Feedback from our participants who completed the survey on mobile devices indicated that the attention check item was presented vertically instead of horizontally, which caused some participants to choose the second answer from the right, or to not answer the question. We therefore did not use the attention check. item for participant exclusion. Results excluding those participants who failed the attention check were generally consistent with the results including those participants can be found in the supplementary materials (Appendix II).

a follow-up question about how long ago they were married. Finally, participants received a chance to comment and were debriefed.

Analytical Rationale

Cross-Sectional Analyses. To investigate the impact of value and values-as-traits and their (dis)similarity on relationship quality, we employed polynomial regression and RSA (J. R. Edwards, 2002).

Polynomial Regression. In polynomial regression models, the outcome is predicted simultaneously by both partners' scores (or own and perceived values, for example), while estimating coefficients for both linear and quadratic terms and the interaction between both partners' scores. The resulting regression (Equation 9; applied to values) is below:

$$RQ_A = b_0 + b_1 V_A + b_2 V_P + b_3 V_A^2 + b_4 V_A V_P + b_5 V_P^2 + e \quad (9)$$

where *RQ* represents relationship quality, *V* represents a value score, the subscript *A* represents the Actor, the subscript *P* represents the partner, and *e* is the error term. For congruence effects, the most informative parameter is the interaction term (b_4). This term should be significantly positive for an effect of similarity, and significantly negative for an effect of complementarity, although definitive conclusions about similarity and complementarity also depend on the shape yielded by the polynomial response surface analysis (below).

However, it can be assumed that the relationship quality between two partners will not be independent. If ignored, such a hierarchical structure in the data can severely distort results and heighten the chance of obtaining a false positive (Musca et al., 2011). We therefore used a multilevel model, letting the intercept for every couple vary randomly, as expressed below (Equation 10):

$$RQ_{A_j} = \beta_0 + \beta_1 V_{A_j} + \beta_2 V_{P_j} + \beta_3 V_{A_j}^2 + \beta_4 V_{A_j} V_{P_j} + \beta_5 V_{P_j}^2 + r_j + e_{Aj} \quad (10)$$

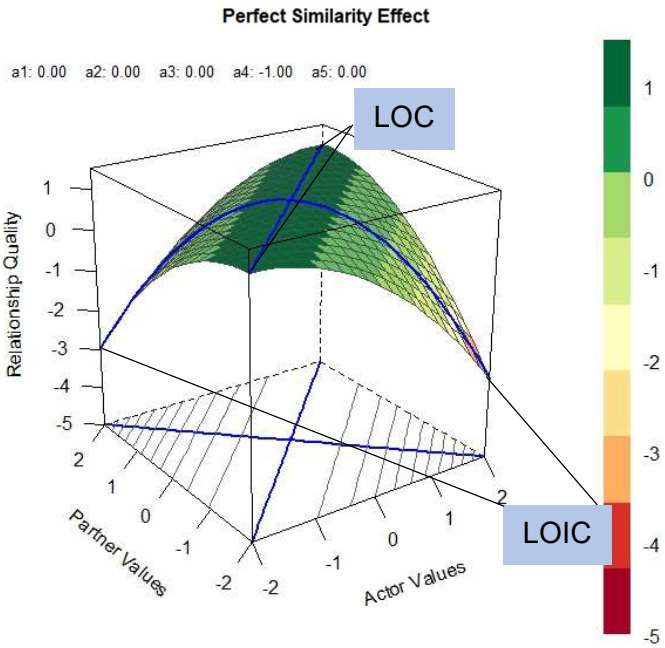
Where r_j represents the extent to which intercept of couple *j* varies from the overall intercept b_0. In this way, the coefficients present in Equation 10 are modelled as equal for all couples (i.e., fixed), while the baseline level of relationship quality is modelled as differing randomly

among couples, thereby controlling for the pre-existing levels of interdependence among partners.

We did not split the sample into men and women, which would have been another way to deal with interdependence. The existence of same-sex couples within our sample and a lack of previous theoretical rationale for hypothesizing gendered differences led us to view our dyads together. The results of all our principal analyses are robust when controlling for gender, type of relationship (marriage vs. other), parenthood, relationship duration at T1, cohabitation status, gender composition of the couple, and participant age. Results for when these covariates are taken into account can be found in the supplementary materials.

Figure 11

Response surface of a perfect similarity effect



Note. The LOC is shown on the ridge, while the LOIC curves from the left end to the right end of the plot (i.e., x = -2|y = 2 to x = 2|y = -2).

Response Surface Analysis. We used the fixed effects coefficients of the multilevel polynomial regression model to determine the shape of response surfaces. These coefficients help to visualize the three-dimensional relationship between standardised actor and partner scores in predicting relationship quality. In a perfect similarity effect, a response surface would be saddle shaped, with relationship quality maximized along the line of congruence (LOC, Figure 11). To compute the response surface, we used the regression (fixed effects) coefficients to calculate the surface parameters (a_1, a_2, a_3, and a_4). The first two parameters signify the slope and curvature along the LOC, while the second two show slope and curvature along the LOIC. Of most importance is the curvature along the LOIC (a_4), where an effect of perfect similarity would have a significantly negative value, while a perfect effect of dissimilarity would have a significantly positive value. For true (dis)similarity , there should be no other significant response surface coefficients ($a_1 = a_2 =$

$a_3 = 0$). In all our analyses, all predictors and outcomes were z-standardised for comparability.

Longitudinal Causal Analyses. To investigate whether the strength of the causal directions from values/traits to relationship quality is stronger than the strength of the causal direction from relationship quality to values or values-as-traits, we used a cross-lagged bootstrapping approach. In a first step, we estimated the standardised beta weights of the earlier instance of a value or value-as-trait on a later measurement of relationship quality, while controlling for the earlier measurement of relationship quality, for each gap between waves, T1-T2, T2-T3, T1-T3, shown in Equation 11 below:

$$RQ_{T+1|T+2_{ij}} = \beta_0 + \beta_1 V_{T_{ij}} + \beta_2 RQ_{T_{ij}} + r_j + e_{ij} \quad (11)$$

where *V* represents any value or value-as-trait score of person *i* at time of measurement *T*. Note that, depending on the comparison, the outcome variable can either be relationship quality at the next measurement point or the measurement point after next (e.g., when comparing T1 to T3). In this case, the outcome would be at T+2 instead of T+1 in Equation 11. We also let each couple's intercept vary randomly to control for interdependence in values, values-as-traits, and relationship quality. For the second step, we evaluated the inverse model (Equation 12):

$$V_{T+1|T+2_{ij}} = \beta_0 + \beta_1 RQ_{T_{ij}} + \beta_2 V_{T_{ij}} + r_j + e_{ij} \quad (12)$$

In both instances, the coefficient of interest is β_1 (which we will denote $\beta_{1\uparrow}$ for the bottom-up causal direction from values/values-as-traits to relationship quality, and $\beta_{1\downarrow}$ for the top-down causal direction from relationship quality to values/values-as-traits). In a final step, the difference between those two standardised parameters was taken (Equation 13):

$$\beta_{\uparrow\downarrow} = \beta_{1\uparrow} - \beta_{1\downarrow} \quad (13)$$

Here, positive values of $\beta_{\uparrow\downarrow}$ indicate a stronger causal link from values/values-as-traits to relationship quality, while negative values of $\beta_{\uparrow\downarrow}$ indicate a stronger causal link from

relationship quality to values/values-as-traits. We drew 5000 random subsamples (with replacement) to estimate one $\beta_{\uparrow\downarrow}$ for each value or value-as-trait for each wave-comparison. To detect a significant difference in causal strength, more than 4875 (97.5%) random subsamples were required to show either a uniformly positive or a negative value of $\beta_{\uparrow\downarrow}$. This is equivalent to $p < .05$ (two-sided test).

Results

Cross-Sectional Analyses

To confirm the necessity of using multilevel models, we calculated the intraclass correlation coefficient for relationship quality grouped by couples. Results showed strong interdependence between partners in their relationship quality (Intraclass correlation at T1: ICC = .56; at T2: ICC = .52, at T3: ICC = .47, all p < .001). Consequently, we modelled a random intercept for each couple. All tables represent the results without exclusions for failing the attention check or control variables. Tables for the revised analysis with such exclusions and all control variables can be found in the supplementary materials. Exclusions and control variables did not affect the presence or absence of the benevolence complementarity effect at any wave.

Actor and Partner Effects. Results for the multilevel polynomial analysis per wave can be seen in Tables 8-10. Most values and values-as-traits are positively associated with higher relationship quality. After taking the alpha correction into account (α = .005), across all polynomial models, actor effects in benevolence values and traits were the only consistent predictors of relationship quality. While this pattern was also evident for self-transcendent values in general, it was not always the case for universalism values and traits, which did not significantly predict relationship quality after the applying the alpha correction at T3.

Actor effects of conservation values or traits rarely reached significance at the adjusted alpha level. As an exception, participants with higher security values (and sometimes security traits) reported more relationship satisfaction in all three waves. Values with conformity content predicted higher relationship satisfaction only in the first wave, and conformity traits predicted higher relationship satisfaction only in the last wave. Lastly, while tradition values and traits were least related to relationship quality, there was a significant negative partner effect of traits with tradition content at T3: having a partner who acts to promote tradition was related to lower relationship quality at this time point.

Dyadic Effects. Contrary to our hypotheses, the complementarity effect did not arise for self-transcendent values or traits (see Figures 12a and 12b) at any point of measurement.

Table 8

Multilevel polynomial regression fixed effects and response surface analyses for T1 (n = 148 couples)

	SVS							SVS-T						
	UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON
β_1	**.23*** **	**.22*** **	**.18** **	.08	**.17** **	**.23*** **	.16**	**.20** **	**.24*** **	.16**	.02	.13*	**.22*** **	.11^t
β_2	.09	.00	-.00	-.08	.01	.04	-.06	.06	.11^t	.04	-.09	-.03	.06	-.06
β_3	.10*	-.01	.06	-.00	.00	.04	.03	.11**	-.03	.10*	.01	.02	.03	.04
β_4	-.05^t	-.08	.02	-.10	-.02	-.06	.02	-.03	**-.22** **	-.07	-.08	-.08	-.12^t	-.11
β_5	.08	-.01	.06	.02	.08^t	.04	.06	.06	.08^t	.10	-.02	-.01	.07	.03
a_1	.32*	.22^t	.17	-.00	.18	.27*	.10	.27*	.35**	.21^t	-.07	.10	.28*	.06
a_2	.13	-.10	.14	-.08	.06	.02	.07	.14	-.17^t	.09	-.09	-.07	-.02	-.04
a_3	.14^t	.22*	.18^t	.16^t	.16^t	.19*	.21*	.14^t	.14*	.12	.11	.16^t	.16*	.16^t
a_4	.23	.06	.10	.11	.11	.14	.10	.21	.28*	.22	.08	.09	.23	.18
R^2	**.07*** **	**.06** **	.04*	.02	.05**	**.07** **	.04^t	**.06** **	**.14*** **	.05*	.02	.03^t	**.09*** **	.02

Note. Coefficients in bold are significant at the corrected alpha level of $p < .005$. R^2 was computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. β_1 = actor effect, β_2 = partner effect, β_3 = quadratic actor effect, β_4 = actor x partner interaction, β_5 = quadratic partner effect, a_1 = linear effect on LOC, a_2 = quadratic effect on LOC, a_3 = linear effect on LOIC, a_4 = quadratic effect on LOIC. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, SVS = values, SVS-T = values-as-traits

$^t p < .1$ *$p < .05$, **$p < .01$, ***$p < .001$

Similarly, we did not replicate the earlier evidence of a complementarity effect in conservation values or traits at any point of measurement (see Figures 13a and 13b). Given the evidence from our prior cross-sectional study, we conducted exploratory analyses of the value subtypes within these two higher-order values. These analyses revealed the hypothesised complementarity effect in benevolent values-as-traits (but not benevolent values) at T1 (see Figures 14a and 14b). As we had predicted for self-transcendence in general, individuals high in trait benevolence benefited less from a benevolent partner than did those low in trait benevolence. However, we did not find the same pattern for

Table 9

Multilevel polynomial regression fixed effects and response surface analyses for T2 (n = 94 couples)

	SVS							SVS-T						
	UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON
β_1	**.30*** **	**.23** **	.15*	.09	**.23** **	**.28*** **	.18*	**.27*** **	**.23** **	.17**	.08	.19*	**.28*** **	.15*
β_2	.04	.00	-.01	-.09	.08	.04	-.05	.06	.06	.04	-.06	.07	.05	-.01
β_3	.08^t	.02	.06	-.03	.11^t	.05	.06	**.15** **	.07	.10	-.03	.07	.11*	.04
β_4	.02	.01	-.06	.02	-.07	.03	-.09	-.10	.05	-.07	.04	-.03	-.02	.02
β_5	-.07^t	-.01	.02	-.03	.03	.05	.01	.07	.08	.07	.01	.07	.06	.04
a_1	.35*	.23	.15	-.00	.24	.32*	.12	.34**	.29^t	.21^t	.02	.26^t	.33*	.14
a_2	.02	.01	.04	-.04	.06	-.00	-.02	.11	.20	.09	.01	.11	.14	.10
a_3	.26*	.23^t	.16	.18	.22^t	.23*	.23^t	.21*	.17^t	.12	.14	.12	.23^t	.16
a_4	-.01	-.00	.17	.07	.21	-.06	.15	.32*	.11	.22	-.06	.19	.19	.07
R^2	**.12*** **	.07*	.03	.01	.05	**.11*** **	.03	**.12*** **	**.10** **	.05*	.01	.06*	**.12*** **	.08

Note. Coefficients in bold are significant at the corrected alpha level of $p < .005$. R^2 was computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. β_1 = actor effect, β_2 = partner effect, β_3 = quadratic actor effect, β_4 = actor x partner interaction, β_5 = quadratic partner effect, a_1 = linear effect on LOC, a_2 = quadratic effect on LOC, a_3 = linear effect on LOIC, a_4 = quadratic effect on LOIC. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, SVS = values, SVS-T = values-as-traits

$^t p < .1$ *$p < .05$, **$p < .01$, ***$p < .001$

benevolence (value or trait) at any other measurement point, nor did we find it for any other value content. Despite the strength of the benevolence complementarity effect at T1 (explaining 14% of variance in relationship quality in equal parts with the main effect), the interaction was not significant at T2 or T3.

To see whether the unsuccessful internal replications were related to systemic drop-out, we reran the analysis of the T1 data, including only couples who went on to contribute valid data at T2. We found the benevolence complementarity effect within that subsample (β_4 = -.16, p = .035; a_4 = .21, p = .019), and also when only looking at the T1 data of couples who would contribute valid data at T3 (β_4 = -.19, p = .018; a_4 = .24, p = .012). These

Table 10

Multilevel polynomial regression fixed effects and response surface analyses for T3 (n = 85 couples)

	SVS							SVS-T						
	UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON
β_1	.20*	**.27*** **	.17*	.10	**.32*** **	**.25** **	.21**	.21*	**.35*** **	**.30*** **	.05	**.28** **	**.31*** **	.22**
β_2	.09	-.04	-.12	-.22**	-.07	.02	-.19*	.06	.05	-.03	**-.29** **	-.07	.07	-.18*
β_3	.09	.02	.03	.03	.13*	-.01	.07	.10**	.04	.12**	.06	.08^t	.02	.08*
β_4	-.11	-.03	.08	-.04	-.06	-.01	-.03	-.08	-.01	.05	.12	.03	-.07	.04
β_5	.15*	.05	-.02	-.01	.07	.02	.00	.05	.07	.03	-.04	.04	.05	.01
a_1	.29^t	.22	.05	-.12	.25^t	.28^t	.02	.27	.40*	.27^t	-.24	.21	.38*	.04
a_2	.06	.04	.09	-.02	.14	-.01	.04	.07	.10	.19^t	.14	.15	.00	.13
a_3	.11	.31*	.29*	.33*	.39*	.23*	.40*	.15	.30*	.34*	.34*	.34*	.23*	.39*
a_4	.41	.10	.08	.06	.27	.01	.10	.23	.12	.10	-.10	.10	.14	.05
R^2	.07*	.08*	.04	.05	**.10** **	.08*	.05	.08*	**.15*** **	**.11** **	.07*	.08*	**.13*** **	.07*

Note. Coefficients in bold are significant at the corrected alpha level of $p < .005$. R^2 was computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. β_1 = actor effect, β_2 = partner effect, β_3 = quadratic actor effect, β_4 = actor x partner interaction, β_5 = quadratic partner effect, a_1 = linear effect on LOC, a_2 = quadratic effect on LOC, a_3 = linear effect on LOIC, a_4 = quadratic effect on LOIC. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, SVS = values, SVS-T = values-as-traits

$^t p < .1$ *$p < .05$, **$p < .01$, ***$p < .001$

replications in the subsamples at T1 rule out attribution of the subsequent null effects to selective drop-out. Looking at alternative explanations for the lack of a complementarity effect at later waves revealed a marginally significant three-way interaction with the rate of change (absolute difference) in benevolent traits between T1 and T2 (β = -.21, p = .056).

Simple slope analysis showed that the actor-partner interaction was marginally stronger within individuals whose self-reported benevolence traits varied more strongly between T1 and T2, (β = -.15, p = .084) than between individuals whose levels of trait

Figure 12

Response surfaces for self-transcendence values (a) and values-as-traits (b) at T1

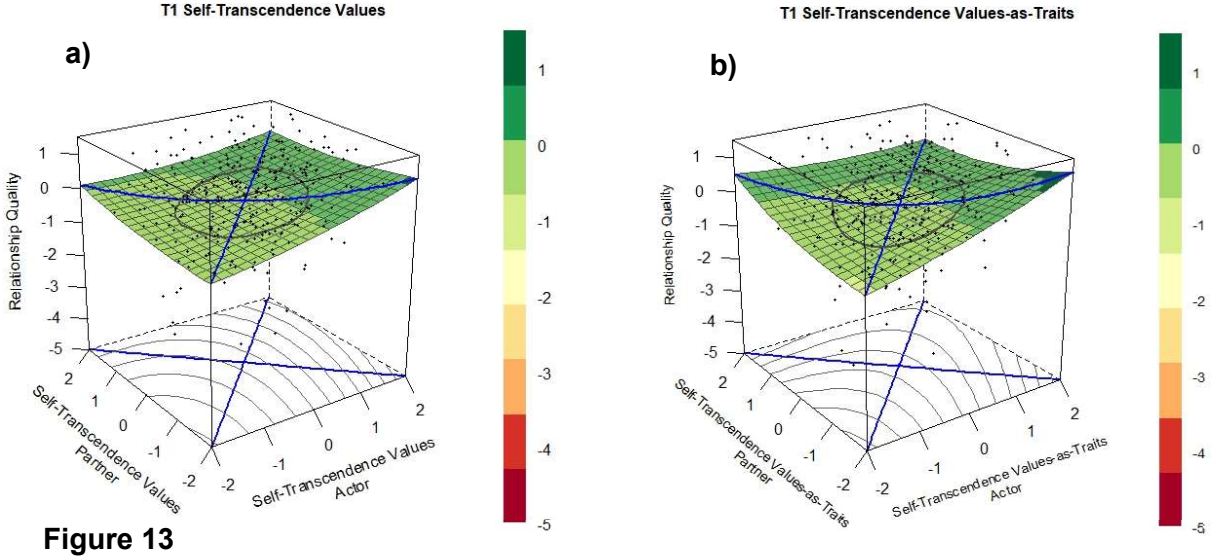


Figure 13

Response surfaces for conservation values (a) and values-as-traits (b) at T1

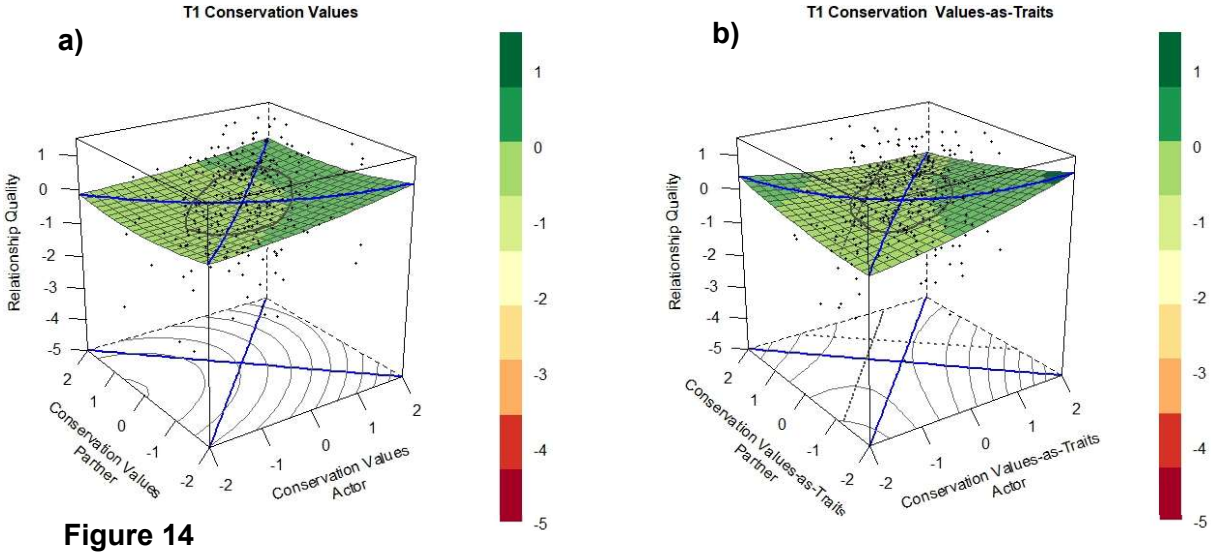
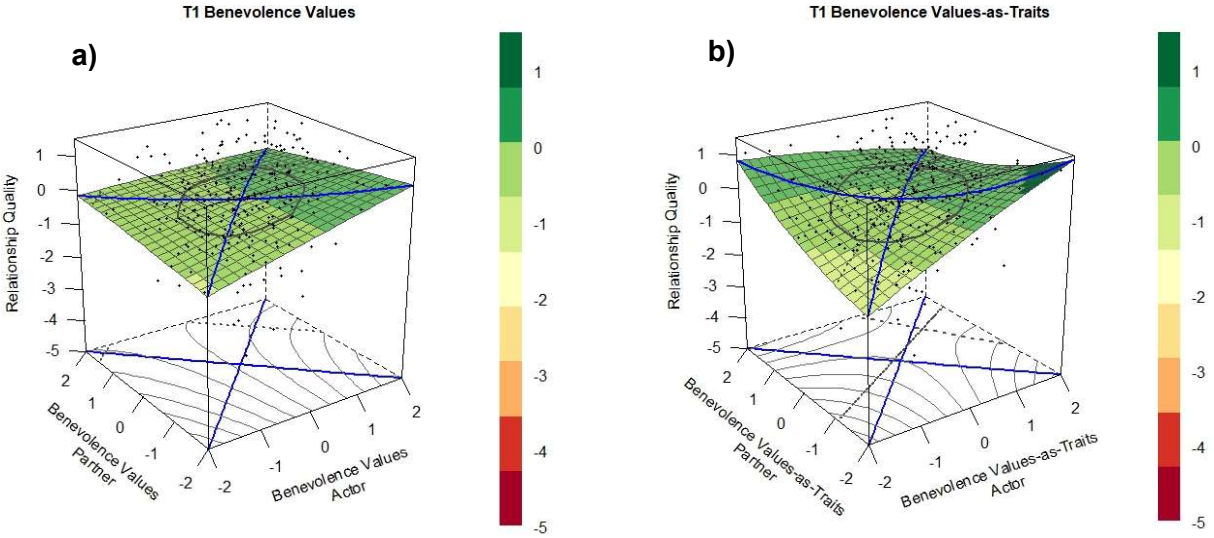


Figure 14

Response surfaces for benevolence values (a) and values-as-traits (b) at T1



benevolence remained stable, (β = .06, p = .678). For our sample, this observation is interesting because systematic changes in the importance of benevolence for individuals of college age (most of our participants were students) have been documented by Bardi et al. (2009), who also find similar levels of stability and change as we observed over roughly the same amount of time (1 year vs our 8 months).[5]

But who changed their benevolence traits? Through correlating trait benevolence at T1 with the algebraic difference between trait benevolence at T2 and T1 we found a significant trend for people with more "extreme" benevolence traits (low or high) to move closer to the sample mean of trait benevolence across waves, $r(191) = -.38$, $p < .001$ (mean algebraic difference: $M = .01$, $SD = .85$). This process repeated between T3 and T2, $r(159) = -.43$, $p < .001$, and was exclusive to self-transcendence traits (as it also occurred for universalism traits: T1-T2: $r(191) = -.51$ $p < .001$.; T2-T3: $r(191) = -.61$, $p < .001$, and did not occur for trait conservation, $r(191) = .04$, $p = .574$.) Participants with stronger benevolent traits decreased in trait benevolence between T1 and T2, while participants with lower benevolence traits increased in benevolence. To make sure that this is not due to the higher number of cases at the ceiling in self-transcendence traits (who arguably can only change by decreasing their rating), we looked at security traits ($M = 1.98$, $SD = 1.26$), which are comparable to universalism traits ($M = 2.17$, $SD = 1.24$) in respect to the amount of rating at the ceiling, and found no correlation between the algebraic T2-T1 difference score and T1 security traits, $r(191) = -.03$, $p = .717$. Thus, the highly dissimilar couples who exhibited the complementarity effect in benevolence values at T1 became gradually more centrist (and thus similar) in their self-transcendent traits, reducing the number of extremely different couples in the sample and limiting the ability of our longitudinal design to detect differences in successive measurement waves.

Longitudinal Analyses

For the longitudinal analyses, we included individuals who completed both waves that were compared. Because the longitudinal analysis was not dyadic in nature, we did not exclude individuals for their partner's poor data quality. Stability over 8 months tended to be higher for values than for values-as-traits[6]. Nonetheless, the stability in values was similar to the stability observed for values in other research studying a similar population (college students) over a similar amount of time (Bardi et al., 2009). Overall, there was more

[5] When the attention check was considered as grounds for exclusion, dropping the sample down to 70 couples with valid observations from both partners at both points of time, yet the three-way interaction increases in significance (β = -.25, p = .034).

[6] The stability of values-as-traits increased considerably and reached similar levels as the values after excluding the individuals who failed the attention check (see supplementary materials).

evidence for bottom-up effects than for top-down effects. Out of the 42 tests conducted for each direction, seven bottom-up effects were significant, which is five more than the two that would be expected by chance (42 x .05 = 2.1). For the top down direction, two effects were significant, which approximates chance expectations.

Specifically, relationship quality predicted changes in universalism values T1 to T2, and changes in benevolence traits from T1 to T3. Among the significant bottom-up findings were effects of universalism, benevolence, and security values, as well as benevolence traits predicting changes in relationship quality (Table 11). These significant effects were mostly obtained from the T2-T3 comparison and mostly self-transcendent content. The results thus reveal stronger evidence for values influencing relationship quality than vice versa. At the same time, however, these data do not entirely refute the possibility bidirectional influences, because differences between bottom-up and top-down directionalities were not significantly different from zero in our tests of bootstrapped confidence intervals (Table 12).

Finally, reading the articles about relationships was not related to changes in couples' relationship quality longitudinally between T1 and T2 (β = -.09, p = .264), or between T2 and T3 (β =.00, p = .980). Thus, there was no evidence that this incentivisation strategy altered outcomes or causal pathways.

Discussion

In the present research, we aimed to replicate a previously found complementarity effect previously in self-transcendent values-as-traits (Leikas et al., 2018; Litzellachner et al., 2020; Tidwell et al., 2013) in our cross-sectional, within-wave analyses. In addition, we sought to examine the causal dynamics between values and values-as-traits with relationship quality in our longitudinal analyses.

Complementarity Effects

While we did not find the hypothesised effect of complementarity for self-transcendent values-as-traits, we did find the complementarity effect in the benevolence subtype of these values. The significance of this finding is bolstered by the rigorous methodology we used (e.g., full randomisation of the order of blocks, scales within blocks, and items within scales). This evidence should also be considered in light of the fact that prior research establishing a role for self-transcendence traits (Litzellachner et al., 2020) used a much less precise short-form measure of values-as-traits (the SSVS; Lindeman & Verkasalo, 2005), which is aimed at assessing the motivational content of the higher-order

Table 11

Cross-lagged model results for all values and values-as-traits in relation to relationship quality

		T1-T2 (N = 209)				T2-T3 (N = 189)				T1-T3 (N = 176)			
		$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*
SVS	UN	-.01	.801	.14	.010*	.12	.014*	.00	.963	.05	.376	.06	.365
	BE	-.01	.860	.01	.873	.14	.006**	.02	.756	.14	.026*	.07	.222
	CO	.06	.247	-.06	.265	.07	.188	.03	.493	.10	.082	-.04	.446
	TR	.04	.429	-.01	.776	.06	.266	-.06	.212	.07	.202	-.06	.237
	SE	.01	.759	-.01	.815	.10	.044*	.09	.068	.07	.252	.07	.277
	SET	-.01	.804	.08	.128	.15	.004**	.01	.862	.10	.094	.06	.267
	CON	.04	.405	-.04	.353	.09	.095	.02	.728	.09	.113	-.04	.509
SVS -T	UN	-.05	.352	.09	.169	.08	.138	.08	.147	.03	.547	.08	.272
	BE	-.08	.088	.08	.236	.15	.004**	.10	.082	.05	.365	.15	.024*
	CO	.02	.645	.07	.216	.11	.039*	.05	.313	.09	.145	.08	.150
	TR	.01	.837	.02	.749	-.02	.749	-.05	.349	.06	.322	-.07	.201
	SE	-.05	.378	.03	.648	.06	.251	.11	.063	-.02	.764	.06	.396
	SET	-.07	.142	.09	.155	.12	.022*	.10	.068	.05	.406	.13	.057
	CON	-.01	.845	.02	.660	.05	.330	.03	.581	.04	.471	.00	.967

Note. The sample for each comparison comprised individuals (not couples) with complete data in relevant variables in both waves, who also passed data quality checks. The $\beta_{\uparrow}$ column shows coefficients for earlier values or traits predicting later relationship quality, while the $\beta_{\downarrow}$ column shows coefficients for earlier relationship quality predicting later values or traits. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, SVS = values, SVS-T = values-as-traits

*p < .05, **p < .01, ***p < .001

value dimensions and was not reliable for locating effects from specific value types, such as benevolence. Our findings indicate that this prior effect of self-transcendence was likely carried by benevolence and increase confidence in the genuine nature of the benevolence complementarity effect.

In addition, it is interesting that we confirmed that the lowest quality relationships are those where both partners are low in benevolence. Indeed, we might expect such relationships to be troubled from an interdependence standpoint. In interdependence theory, the behaviour of two partners is important when a conflict of interests arises (Malouff et al., 2010). Such situations require the transformation of at least one partner's self-centred motivation to pro-relationship motivation, because one partner needs to accommodate the partner's desire to the potential detriment of their own. Because individuals high in

Table 12

Stability and bootstrapping results for the causal direction of all values and values-as-traits predicting relationship quality in all possible wave comparisons

		T1-T2 (N = 209)				T2-T3 (N = 189)				T1-T3 (N = 176)			
		$r_{1\text{-}2}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-.	*p*	$r_{2\text{-}3}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-	*p*	$r_{1\text{-}3}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-.	*p*
SVS	UN	.66	164	4836	.065	.73	4783	217	.089	.65	2494	2506	.998
	BE	.71	1870	3130	.748	.68	4650	350	.140	.66	3130	1870	.748
	CO	.68	4831	169	.068	.75	2735	2265	.906	.70	4787	213	.085
	TR	.72	3467	1533	.613	.74	4540	460	.184	.73	4333	667	.267
	SE	.67	2788	2212	.885	.74	3427	1573	.629	.62	2229	2771	.892
	SET	.70	677	4323	.135	.73	4822	178	.071	.66	2992	2008	.803
	CON	.76	4243	757	.303	.75	4151	849	.400	.75	4658	342	.137
SVS -T	UN	.55	173	4827	.069	.68	3110	1890	.756	.51	1794	3206	.718
	BE	.52	697	4303	.279	.64	3846	1154	.462	.55	1298	3702	.519
	CO	.58	944	4056	.378	.70	4357	643	.257	.64	3323	1677	.671
	TR	.72	3445	1555	.622	.73	2255	2745	.902	.74	4536	464	.186
	SE	.59	907	4093	.363	.61	1748	3252	.699	.57	1366	3634	.546
	SET	.52	286	4714	.114	.68	3547	1453	.581	.50	1394	3606	.558
	CON	.70	1972	3028	.789	.75	3227	1773	.709	.74	3907	1093	.437

Note. All comparisons were run with 5000 iterations. The sample for each comparison comprised individuals (not couples) with complete data in relevant variables in both waves, who also passed attention and data quality checks. The $\beta_{\uparrow\downarrow}$+ column shows the number of iterations where the values or values-as-traits coefficient in predicting changes in relationship quality was higher than the relationship quality coefficient predicting changes in values or values-as-traits. The$\beta_{\uparrow\downarrow}$- coefficient shows the number of iterations where the opposite was true. All p-values were two-sided. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, SVS = values, SVS-T = values-as-traits

*p < .05, **p < .01, ***p < .001

benevolence display more prosocial behaviour in general (Hanel et al., 2018), couples with at least one benevolent partner would be expected to navigate these situations better than couples where neither partner construes themselves as particularly benevolent.

Another conclusion from the pattern of results is that the partner's benevolence is more important for individuals low in benevolence themselves. Potentially, this importance might be due to differences in the relationship orientation desired by partners. Individuals who desire a strictly communal relationship (i.e., one that is not based on reciprocal benefit) experience feelings of authenticity and self-verification when acting in a prosocial manner towards their partner (Kogan et al., 2010). Because non-reciprocally caring for others is part

of the self-concept of individuals high in communal orientation (Mills et al., 2004), communally oriented individuals often react negatively to their other's reciprocity of prosocial behaviour (Clark & Mills, 1979). This negative reaction is theoretically less likely among the individuals who are not communally oriented, who can happily receive the prosocial orientation without a threat to their self-concept. Because self-transcendence (presumably especially benevolence) is also highly correlated with communal strength (i.e., the intrinsic desire to respond to one's partner's needs; van der Wal et al., 2020), highly benevolent partners could obtain more self-verification if they are in a relationship with someone less benevolent than them. This desire for self-verification might also explain why Tidwell et al.'s (2013) speed daters felt more attracted to partners who were lower than them in friendliness and dependability. In fact, our data reproduce Tidwell et al.'s (2013) result after using their method of predicting relationship quality with a reverse-coded absolute difference score in trait benevolence controlling for actor and partner effects (β = -.18, p = .025), which is encouraging given the frequent past failures to replicate similarity effects after only small changes to methods (e.g., Dyrenforth et al., 2010).

The connection of benevolence to communal motivation might also explain why trait benevolence did not show an additive effect between partners, unlike the pattern previously observed for trait agreeableness (Leikas et al., 2018; Weidmann, Schönbrodt, et al., 2017). When looking at individual items of benevolent values and relationship quality, the strongest correlations were found with the responses for "mature love" (as value: $r(296) = .30$, $p < .001$; as trait: $r(296) = .38$, $p < .001$), which is described as relating to "deep emotional and spiritual intimacy" (Schwartz, 1992). This motivational content might relate to communal orientation in a profound way. People who would describe their behaviour as promoting "mature love" might have an intrinsic motivation to be responsive to their partner's needs (T. N. Le & Levenson, 2005), which is a characteristic of a communal relationship orientation (Mills et al., 2004). Such a stable motivation for a specific type of romantic relationship is notably absent from the Big Five (DeYoung et al., 2007) or HEXACO (Ashton et al., 2004) dimensions of agreeableness. To corroborate this speculation, the effect of agreeableness on relationship satisfaction has been shown to be largely independent of communal relationship orientation (B. M. Le et al., 2013), in contrast to self-transcendence values, which influence relationship quality through communal strength to a large extent (full mediation in van der Wal et al., 2020).

We can only speculate about why this complementarity effect we previously found and replicated at T1 was not evident in the later waves. Our results indicated that the explanation might pertain to changes in the benevolence traits over time. Participants who

very high (or low) in benevolence became less extreme over time, which may have reduced the space for a complementarity effect to emerge. If we assume that partners talked about the survey with one another (which we did not explicitly discourage), it might be that extremely dissimilar, but satisfied, couples were more likely to go through this change. Because relationship quality correlates with the extent to which personal information is self-disclosed (Sprecher & Hendrick, 2004), higher quality couples might be more likely to discover the values of their partner after taking part in our survey. If so, complementary couples may be more likely to change in this longitudinal design after discussing the opposite values or traits of their partner.

Longitudinal Actor Effects

As the first longitudinal investigation of the contributions of values to relationship satisfaction, we obtained evidence that the abilities of values and value-as-traits to predict changes in relationship quality is bottom-up. There was little evidence for a top-down causal pathway from relationship quality to changes in personal values or values-as-traits. Similar to findings for Big Five personality traits (Karney & Bradbury, 1995; Robins et al., 2002; Solomon & Jackson, 2014), values and values-as-traits are more likely to influence relationship quality by defining the extent to which couples cooperate when facing challenges or respond to each other's needs, rather than simply change as a consequence of relationship quality. Because there were no noteworthy longitudinal effects of conservation values or values-as-traits, we can conclude that self-transcendence value content is more important for future relationship functioning. Indeed, individuals high in benevolence values consistently reported more satisfaction with their relationships across all three waves. These data provide first indications for effects of values on relationship quality, although our bootstrapping analysis also indicated that both causal directions remain viable.

Limitations

One limitation of our research is that the drop-out rates we encountered were higher than expected, making the third wave underpowered (sensitivity analysis showed that this sample would allow us to detect smaller medium-sized effects of $f^2 = .09$ at the $\alpha = .05$ level with $1-\beta = .80$). This constraint increases the chances of overlooking important contributions made by values. The prospect for overlooking effects was also present because we measured only self-transcendence and conservation values. Although there were a number of reasons for this focus (see Introduction), future research could also examine the dyadic and longitudinal effects of self-enhancement and openness values on relationship quality. Another investigation showed that the positive effect of self-transcendence on relationship quality was independent of measurement instrument and technique, while a negative effect

of self-enhancement only appeared occasionally depending on measurement instrument and ipsatization of value scores (van der Wal et al., 2020). Comparing our present findings to the previous investigation (Litzellachner et al., 2020), we can conclude that the self-transcendence complementarity is independent of measurement instrument, while the conservation complementarity effect only showed with the short value measure.

Another limitation concerns the nature of most of our sample, consisting of newer relationships between young adults. There may be differences between these relationships and dating relationships of older adults, newlyweds, or long-term marriages (e.g., Shiota & Levenson, 2007). In particular, the effects of complementarity we obtained might be especially relevant for these relationships than for other types because of the different factors that influence assortative mating versus relationship maintenance. There is evidence that similarity increases attraction, which is also true for similarity in dimensions of personality (Bahns et al., 2016, 2017; Byrne et al., 1971; Montoya et al., 2008). Conversely, the role of dyadic interactions of personality in relationship maintenance (relationship quality) is unclear (e.g., Gray & Coons, 2017). Because 70% of the relationships we studied had been in place less than 3 years, it is plausible that the benevolence complementarity effect we obtained reflects a process in partner selection. If this is the case, it would explain why it also appeared in Tidwell et al.'s (2013) sample of speed dating couples. However, we found the effect to be independent of relationship duration after controlling for it (see analysis with all control variables in the Supplementary Materials), and it did not interact with relationship duration (three-way interaction at T1: $b(134) = -.00$, $p = .451$). Therefore, our findings provide some indication for the importance of the benevolence complementarity effect for relationship maintenance, as well as in initial partner selection. Nonetheless, this conclusion would be bolstered by replication in a sample including a higher proportion of relationships that have lasted more than several years.

Conclusion

Using a longitudinal design, we found new evidence that romantic partners' benevolence value orientations leads to higher quality in their relationships in the present and the future. Furthermore, individuals whose trait dispositions exhibit low benevolence benefit more from benevolent partners than do individuals who are high in benevolence. Together, these findings support the importance of benevolence values to relationships and extend long-standing theory about the nature of the interpersonal processes that support relationships. This evidence supports the idea that benevolent values and their behavioural manifestations play a crucial role for the interpersonal exchanges that are central to healthy

relationships (e.g., empathy, perspective taking), particularly when a partner is less likely to offer these relationship foundations.

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Academic Paper 3: Perceptions of Similarity in Personality Influence the Quality of Romantic Relationships. – Clarifying Causal Direction and Mechanism.

Pretext

While the analyses presented in Academic Paper 1 and Academic Paper 2 concerned the influence of actual partner similarity in values and traits, participants in both samples also received questions regarding their perceived similarity to their partner. I present these analyses now in Academic Paper 3, which focused on investigating the connection of perceived similarity to relationship quality. The principal aim of these analyses was to test my new framework, integrating past and modern theories of how perceived similarity relates to relationship quality. More precisely, my framework predicted that perceived personality similarity would only be as beneficial as it provided information about the partner's similar goals. This, in turn, would increase relationship quality by making partner support in pursuit of the goal seem plausible.

Mainly, this framework would then predict that perceived similarity in values and relationship ideals (i.e., more goal-informative domains of personality) were more strongly related to relationship quality than perceived similarity in traits (i.e., a less goal-informative domain). If the prediction was true, such a pattern of results would show both cross-sectionally and longitudinally. Further, because parts of these theoretical links were derived from information processing theory (Ajzen, 1974; M. F. Kaplan & Anderson, 1973), the framework is more suitable to explain bottom-up processes, where perceived similarity causes relationship quality. However, the strength of the causal connections between perceived similarity and relationship quality have never been compared in a non-experimental design. Therefore, this comparison needed to be made in order to understand the ecological relevance of such bottom-up effects for the phenomenon of perceived similarity predicting relationship quality.

Lastly, Academic Paper 3 presents a direct test of my framework in a third sample, by testing mediational models of the indirect effect of perceived similarity in values and relationship ideals through personal and relationship goal similarity, and perceived partner support. Besides testing the plausibility of such a causal path, this analysis also compared whether this causal path is stronger for relationship ideals than for values. This comparison was necessary because my framework predicts that the information about goal similarity only leads to relationship quality to the extent to which perceiving goal similarity facilitates the perception of partner goal support. Crucially, I construed perceived value similarity as informative about the similarity of the partner's personal goals, while I construed perceived relationship ideal similarity as informative about the similarity of the partner's relationship

goals. Perceiving agreement on relationship goals should be more important for perceiving goal support than perceiving agreement in personal goals (which values are informative about), because the outcomes of relationship goals (i.e., more trust, intimacy, or excitement) can only be obtained through joint effort and consequently also affect both partners. If the partner is perceived to dislike an important relationship goal, the individual will be unlikely to interpret the partner's actions as supporting that goal. Accordingly, this study will be the first investigation of a new theoretical paradigm connecting abstract personality domains, concrete goals, prosocial behaviours, and relationship quality.

Perceptions of Similarity between Romantic Partners and Relationship Quality: Clarifying Causal Direction and Mechanism

Litzellachner, L. F.[1]*, Hanel, P. H. P.[1,2], Verplanken, B.[1], & Maio, G. R.[1]

[1]Department of Psychology, University of Bath, Bath, UK

[2]Department of Psychology, University of Essex, Colchester, UK

*Please address correspondence to Lukas Litzellachner, Department of Psychology, University of Bath, Claverton Down, BA2 7AY Bath, United Kingdom: l.f.litzellachner@bath.ac.uk

Author's contributions: Conceptualized: LL PH BV GM; Designed the study: LL PH GM; Data analyses: LL; Visualizations: LL; Wrote original draft: LL PH BV GM; Wrote revised draft: LL PH BV GM

Key Words: personal values, relationship ideals, relationship quality, perceived similarity, goal support

Abstract

Perceived partner similarity in personal values, relationship ideals, and personality traits has been linked to higher relationship quality. Yet, fundamental questions about the relative strength, the causal direction, and mechanisms linking perceived similarity to relationship quality have remain unanswered. To address these questions, we conducted three studies that tested whether perceived similarity communicates positive information about the relationship partner's similar goals. This is assumed to have a positive impact on relationship quality whenever goal similarity would be beneficial for interpersonal goal coordination. Congruent with our model, we show that perceived similarity in values or relationship ideals is more important for relationship quality than perceived similarity in personality traits. Second, using a longitudinal design, we find that the causal direction is stronger from relationship quality to perceived similarity, but that there is evidence for both directions. Lastly, we present experimental evidence for a pathway from perceived similarity to relationship quality through goal similarity and goal support. This pathway explained the connection of perceived similarity in relationship ideals to relationship quality better than for the connection of perceived similarity in personal values to relationship quality. We conclude that our framework best describes the causal connection of perceived similarity to relationship quality (rather than the inverse causal connection of relationship quality to perceived similarity), which plays an important role when partners are evaluating whether they have the same goals for their relationship.

> "Life has taught us that love does not consist of gazing at each other but in looking outward together in the same direction. There is no comradeship except through union in the same high effort"
>
> - *Antoine de Saint-Exupéry*

The above quote from *Wind, Sand, and Stars* in *Airman's Odyssey* (de Saint-Exupéry, 1984, *pp. 195*) claims that love is not found through observing our partners' attributes. Rather, it suggests we find love in our common efforts and goal pursuits. But how much truth does this claim contain? If we perceive our partner as having a similar psychological characteristics to ourselves, is this less important as perceiving them to value the same goals and ideals in their personal life and relationship? In other words, how do perceptions of similarity in psychological characteristics and goals relate to the quality of our relationships over time, and what psychological mechanism connects perceptions of similarity to the quality of romantic relationships?

Despite years of research, these questions remain unaddressed. The causal connection of perceived similarity to relationship quality has been established in experimental designs (e.g., Böhm et al., 2010; Morry, 2005), but we do not know how these two variables relate over time, and we do not know why and how similarity relates to relationship quality. For example, information processing theory holds that perceptual similarities are useful because they let us infer other positive information about our partner (Ajzen, 1974; M. F. Kaplan & Anderson, 1973). Yet, this theory does not explicitly predict which psychological characteristics are more important dimensions for similarity and what kind of positive information should be inferred from them. Thus far, relationship quality has been positively connected to perceived similarity in personal values (Hebb, 2005; Murray et al., 2002; Wu, 2010), relationship ideals (Avivi et al., 2009; Muraru et al., 2017; Preotu & Turliuc, 2013), and personality traits (Amodio & Showers, 2005; Barranti et al., 2017; Furler et al., 2014; Luo & Snider, 2009; Lutz-Zois et al., 2006; Morry et al., 2011; Murray et al., 2002; Murstein & Beck, 1972; Tidwell et al., 2013; Wu, 2010), but these dimensions of perceived similarity have not been compared in the prediction of relationship quality.

Filling these gaps, we propose a novel framework in which perceptions of similarity influence relationship quality to the extent that they are informative about shared personal and relationship goals. We will demonstrate the accuracy of predictions derived from this framework in three studies, using cross-sectional, longitudinal, and experimental designs, respectively.

Perceived Similarity Signals Goal Support

Our framework combines the theoretical insights of information processing theory (Ajzen, 1974; M. F. Kaplan & Anderson, 1973) and transactive goal dynamics (TGD; Fitzsimons et al., 2015). We construe a relationship as a single unit that includes the aim of enhancing the efficiency of goal pursuit for the relationship partners. Goals are desired end states with associated means of attainment (i.e., instruments) in an individual's memory, and these have the potential to become salient and actively pursued (Fishbach & Ferguson, 2007). According to TGD, relationship quality is determined by transactive density and goal coordination. Transactive density is the degree to which one partner's goal pursuits involves the other partner, that is, the degree of goal interdependence. In high-density relationships, individuals pursue goals for, and with, their partner, whereas in low density relationships everyone mainly pursues their own goals independently. However, density is not the sole driver of relationship satisfaction; it merely presents an opportunity for successful goal coordination depending on the degree to which partners' goals "fit", or complement each other. If density is high and the goals are well-coordinated, there will be transactive gains. In TGD, transactive gains (and losses) describe experiences of achieving better (or worse) results with the partner, than one could have achieved otherwise (i.e., alone or with someone else). According to TGD, such experiences drive relationship quality.

From this perspective, pursuing similar goals should enhance goal coordination, leading to transactive gains. For example, perceiving a partner with the same goal might help a person when uncertain whether to commit to that goal (Koo & Fishbach, 2008). Having a close other pursue the goal can signal this commitment, thus facilitating motivation (Fishbach et al., 2011). This effect is similar to implicit coordination (Shteynberg & Galinsky, 2011), where the motivation to pursue a shared (individual) goal is enhanced by the perception of similar others pursuing the same goal. However, some goals have a shared desirable outcome that can only be reached through mutual collaboration. Such superordinate goals have been shown to be especially important for intergroup relationships (Allport, 1954; Mcclendon & Eizen, 1975; Sherif, 1958). Many relationship goals (e.g., having a passionate relationship, becoming parents), constitute such goals. Therefore, perceiving similarity in superordinate relationship goals might be especially beneficial for coordination. In any case, the perception of support in the pursuit of both individual and common goals has been shown to lead to better outcomes and positive relationship evaluations (Brunstein et al., 1996; Emery et al., 2018; Gere et al., 2011; Hofmann et al., 2015; M. Kaplan & Maddux, 2002; Koestner et al., 2012; Molden et al., 2009), and appreciation for the helper (Converse & Fishbach, 2012; Overall et al., 2010). Successful

goal coordination in high density relationships will thus lead to transactive gains, fuelled by partner supportiveness in personal or relationship goals, and thus higher relationship quality.

Which Causal Direction is Dominant?

According to TGD, similarity that facilitates goal coordination should lead to goal support (creating transactive gains) more than similarity that does not facilitate goal coordination, and goal coordination causally enhances relationship quality. We will refer to this direction as the "bottom-up" direction, as it involves evaluations of higher-level dyadic phenomena (i.e., relationship quality), being influenced by evaluations of lower-level self or partner (similarity) perceptions. Indeed, this causal impact is supported by evidence building upon the earlier information integration perspective (Ajzen, 1974; M. F. Kaplan & Anderson, 1973), which is an unambiguous bottom-up theory. It holds that perceiving similarity in any dimension is only useful when this similarity is informative about positive qualities of the other person. The more positive information we gain from perceiving similarity in a certain characteristic, the more positive our evaluation of the other person (Montoya & Horton, 2004). The supporting evidence arises mostly from use of the bogus-stranger paradigm (Byrne et al., 1971; Sillars, 1985). This paradigm presents participants with information about a hypothetical stranger (e.g., a filled-in personality or attitude questionnaire), and then asks participants how much they would like to interact with that person. Such studies generally find positive associations between similarity to the hypothetical stranger and liking (Byrne et al., 1971; Byrne & Rhamey, 1965). Hypothesising information processing mechanisms for this effect, Ajzen (1974) showed that similarity does not predict attraction if similarity is observed in an undesirable trait. This result showed that similarity only had a positive influence if it led to positive evaluations of the other. This was later confirmed by Montoya and Horton (2004), who also found that perceived attitude similarity was related to attraction because it signalled that the other person possesses positively evaluated dispositions (such as the other being a "good person"). Studies using a dating context have used this paradigm to show that similarity causes attraction when similarity is perceived in optimism (Böhm et al., 2010) and attachment styles (Klohnen & Luo, 2003).

However, perceptions of similarity and of goal support might often be partly based in illusions (Murray et al., 2002). People construct illusions, in part, out of a striving for cognitive consistency (Festinger, 1957; Morry, 2005). If someone believes a certain condition (e.g., similarity) to be important for a high-quality relationship, and they perceive their relationship to be high quality, they may infer that this condition is met in their relationship. It is possible that relationship quality causes illusions of goal support, goal similarity, or personality similarity when these things are believed to be important for

relationship functioning. We will refer to this causal direction as the “top-down” direction, as it involves changes in lower-level personal perceptions (i.e., self or partner personality) as a consequence of higher-level dyadic perceptions (i.e., relationship quality). This top-down notion route is consistent with Morry's (2005) attraction-similarity hypothesis. Morry argues that, because similarity can predict attraction at early stages of relationships (Luo, 2009), individuals believe in the importance of similarity for relationship success. At later stages of the relationship, they develop beliefs about the importance of similarity for romantic relationships, leading them to conclude similarity (and potentially other positive illusions, such as goal support) from perceiving a well-functioning relationship. Therefore, both bottom-up and top-down pathways are plausible, and it is important to establish under which conditions either process is occurring.

Effects of Personal Values, Relationship Ideals, and Personality Traits

There is also ambiguity about whether the effects of perceptions of similarity depend on the psychological characteristics that are similar. In particular, research has considered perceived similarity in personal values, relationship ideals, and personality traits, but has not compared these.

Personal values are themselves abstract, trans-situational goals (Schwartz, 1992). According to Schwartz (1992), values can be categorised along two main dimensions, contrasting self-transcendence (e.g., enhancing the welfare of close others, humanity in general, and nature) with self-enhancement (i.e., enhancing one’s own status, success, or pleasure), and openness to change (i.e., pursuing sensual gratification, excitement, and freedom) with conservation (i.e., self-restraint for the safety and stability of the self, society and culture), respectively. As abstract goals, values direct an individual’s behaviour (Bardi & Schwartz, 2003) and influence their choice of more concrete personal goals by imbuing goal-related outcomes with valence (Feather, 1995). For instance, values relate to the probability of migrating to another country (Goodwin et al., 2012) and the choice of university subject or career paths (Bardi et al., 2014). Such links are often straightforward: people who value achievement will choose a personal goal that lets them demonstrate achievement (Parks & Guay, 2012). Thus, their goal character might make perceived value similarity a good signal for common personal goals in relationships.

Similar to values, relationship ideals are closely related to goals. Relationship ideals represent principles an individual believes to be important for a thriving relationship (e.g., passion, having fun, sharing interests). Relationship ideals therefore guide an individual’s behaviour in the relationship context (Fletcher & Simpson, 2000; Muraru et al., 2017). Because they often come with more precisely defined end-states and a specific context (i.e.,

romantic relationships; Fletcher et al., 1999), relationship ideals are slightly more concrete than values. People strive to bring their relationship in line with their ideal perception of a thriving romantic relationship (Murray et al., 1996; Rodriguez et al., 2015). This striving makes relationship ideals directly signal relationship goals, because someone who idealises a relationship characterised by passion and intimacy can only obtain this by being intimate and passionate (Fowers & Owenz, 2010).

In contrast to these goal-related constructs, personality traits describe current personal dispositions, that is, stable ways of thinking, feeling, and acting (McCrae & Costa, 2009). The Big Five model (Goldberg, 1990) categorises personal dispositions into five broad factors: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Manifestations of these traits indirectly relate to the life goals that people chose (Roberts & Robins, 2000) – that is, individuals tend to pick life goals that suit their traits (as shown longitudinally; Roberts et al., 2004). For example, individuals high in extraversion or conscientiousness are more likely to seek economic goals (e.g., having a high-status career), while individuals high in agreeableness are more likely to choose social goals (e.g., working to promote the welfare of others).

Notwithstanding this conceptual association between traits and goals, personality traits do not efficiently signal personal goals because they do not intrinsically denote goals. Of course, goals often subsume end states (Fishbach & Ferguson, 2007), and diverse traits can act as means for goal attainment. However, it is unlikely that an extravert chooses an economic career goal in order to be extraverted, thus making the behaviour (i.e., trait) the goal. Rather, the extravert is likely to choose an economic career goal because it demands a certain degree of extraversion in order to be attained, a resource which the extravert possesses in abundance (Roberts et al., 2004). Nevertheless, because the content of the personality trait does not reflect the goal itself, it might be difficult for one's partner to infer goal similarity from personality similarity.

Perceived value similarity (Hebb, 2005; Murray et al., 2002; Wu, 2010) and perceived relationship ideal similarity (Avivi et al., 2009; Muraru et al., 2017; Preotu & Turliuc, 2013) possess a stronger direct connection to personal goals, potentially leading to a stronger connection to relationship quality. In fact, the few studies that have looked at perceived value similarity (Hebb, 2005; Murray et al., 2002; Wu, 2010), or perceived relationship ideal similarity (Avivi et al., 2009; Muraru et al., 2017; Preotu & Turliuc, 2013) have found a positive link to relationship quality. In contrast, despite there being much more research on perceived similarity in personality traits, research has found only very weak associations between perceived trait similarity and relationship quality (Furler et al., 2014; Morry et al.,

2011) or no effect at all (Amodio & Showers, 2005; Decuyper et al., 2012; Middleton, 1993). Additionally, a meta-analysis that included non-relationship contexts found smaller effect sizes for the effect of perceived trait similarity on interpersonal attraction than for the effect of perceived attitude similarity (Montoya & Horton, 2013). Although these findings in a non-relationship context might not be generalisable to romantic relationships (e.g., Sprecher & Regan, 2002), the aggregate evidence indirectly points to the importance of theoretically and empirically comparing perceived value, relationship ideal, and trait similarity in relationship quality.

The Role of Goal Coordination

To this point, we have emphasised the idea that perceived personality similarity is connected to relationship quality only insofar as it is informative about a partner's likelihood of possessing similar goals (which facilitate goal coordination). We propose that the restricted informativeness of traits in comparison to values and relationship ideals makes personality trait similarity less interconnected to relationship quality than are perceived value similarity or perceived relationship ideal similarity. Furthermore, although we assume a positive effect of similarity in general via the signalling of common goals, we also propose that this similarity is more effective when it occurs in a domain that is important for coordination; that is, similarity should matter more for goals with shared outcomes that can only be reached together, as is the case for relationship-specific, superordinate goals. Accordingly, we predict that perceived relationship ideal similarity should be even more important for relationship quality than perceived value similarity.

To elaborate on the latter prediction, perceived value similarity may facilitate perceptions of personal goal similarity, but perceived personal goal similarity is not intrinsically conducive to relationship quality. For example, while perceived goal similarity can increase commitment (Koo & Fishbach, 2008), an increase in commitment might not always be helpful. At later stages of goal pursuit, wherein commitment is certain, obtaining personal progress becomes more and more of interest (Koo & Fishbach, 2012), for which similarity might not be as beneficial. Accordingly, Huang et al. (2015) observed that new weightwatchers drew closer to their fellow group members at early stages of the program (perceiving the same weight-loss goal). However, as individual progress became the focus after a few months, they became more distant to other members. Partners with similar goals might even see each other as competitors in their important personal goal pursuits. The self-evaluation maintenance model (Tesser, 1988) predicts that perceiving a superior performance from a close partner on an important, self-defining activity can be perceived as a threat by individuals (for an empirical demonstration in a relationship context, see

Pilkington et al., 1991). This dissonance creates the potential for a situation wherein supporting the partner might lead to being outperformed and is thus against the personal goal. Pursuing the same value-elicited individual goals (e.g., career goals) in highly interdependent relationships might also lead to resource competition and conflict (e.g., partner's arguing who gets to work for a promotion and who has to watch the kids; Fitzsimons et al., 2015).

Moreover, perceived personal goal *dissimilarity* might lead to perceived partner support through complementarity. Pilkington et al. (1991) found that perceiving less overlap in goals and abilities with a successful partner can lead to giving interpersonal support. In their studies, partners rated the importance of several activities to themselves and their partner. They also rated their own and their partner's level of performance in each activity. If the activity was perceived to be important to both partners, the individual would not consistently credit the partner for being the superior performer. However, whenever a person rated an activity as more important to their partner, that person would be more likely to credit the partner as the superior performer. Thus, individuals who perceive their partner as complimentary in dimensions that can be construed in terms of performance (like many goals and values related to self-enhancement) might be more willing to acknowledge their performance or give positive feedback (Morrison & Weldon, 1990) than individuals who perceive a partner to be similar in those dimensions.

In contrast, perceived relationship goal similarity is directly beneficial. Relationship goal similarity creates a logical foundation for believing that a partner's actions reflect relationship goal support, because humans are biased toward interpreting observed behaviour in terms of assumed goals (for a review, see Van Overwalle & Baetens, 2009). In contrast, perceived dissimilarity in relationship goals/ideals will rarely be conducive to perceiving this support. A person who does not perceive their partner to want the same relationship goal has less reason to interpret the partner's actions as supportive of that goal. A perception of dissimilar relationship goals could even lead the person to conclude a zero-sum situation, wherein their goals can only be obtained at the expense of their partner's goals, and vice versa. In line with this reasoning, Crocker et al. (2017) found that individuals with zero-sum beliefs report significantly lower partner responsiveness to their needs, compared to people with nonzero-sum mindsets (i.e., the relationship as a win-win situation).

In sum, the inherent superordinate nature of common relationship goals directly leads to the potential for coordination, as simultaneous and mutual belief in the importance of the superordinate goal is a requirement for its attainment. In contrast, effects of personal goal similarity depend on various factors, such as whether goal similarity helps to generate

commitment (Huang et al., 2015), facilitates implicit coordination (Shteynberg & Galinsky, 2011), and does not create rivalry (Tesser, 1988). Overall, then, shared relationship goals (as inferred from shared relationship ideals) should have a stronger, more consistent tendency to create (perceptions of) goal support and therefore enhance relationship quality than shared personal goals (as inferred from shared values).

The Current Research

We conducted three studies investigating the roles of perceived similarity in values, relationship ideals, and personality traits in predicting relationship quality. In Study 1, we cross-sectionally examined associations between perceived similarity in values, relationship ideals, or personality traits and relationship quality. This study enabled the first direct comparisons of the associations between perceived similarity and relationship quality across all three variables in the same couples. Thereby, the first study was purely exploratory at the time of being conducted and informed our theoretical integration of the TGD and information integration perspectives.

Study 2 longitudinally investigated the causal relationship between perceived similarity in personality dimensions and relationship quality in a natural setting. This preregistered (osf.io/tpzk7) study tested whether findings from Study 1 replicated and whether there was evidence for a stronger bottom-up or top-down influence of perceived similarity on relationship quality across four-month and eight-month intervals. Finally, Study 3, applied an experimental mediation analysis to test whether perceived value similarity and perceived relationship ideal similarity are related to relationship satisfaction through effects on perceived support in personal (non-relationship) goals or relationship goals, respectively. This experiment also tested whether a manipulation of the goal context moderates the mediational role of perceived goal support in the perceived similarity – relationship quality connection, with mediation being stronger in the relationship context (i.e., for relationship ideals and relationship goals) than in the personal (non-relationship) context (i.e., for values and personal goals).

Study 1 – Cross-Sectional Comparison of Similarity Dimensions

Method

Participants. We recruited 553 individuals (178 couples and 197 individuals whose partner did not participate) in close romantic relationships for at least 3 months. They were recruited for a larger study on perceived and actual similarity in values, relationship ideals, and traits (Litzellachner et al., 2020b). After excluding three couples (two completed an older version of the questionnaire, and one was identified as a double entry), and 12

individuals who completed the questionnaire in under 10 minutes (an exclusion criteria to preserve data quality), the final sample consisted of 535 individuals (174 couples and 187 unrelated individuals; M_{age} = 23.39, *SD* = 6.27, average relationship duration = 35.56 months, *SD* = 54.53 months). Participants were recruited online and on the campus of a university in England. Seventy-three percent of the sample were university students, 91% were in dating relationships, and 9% were married. Couples were matched through anonymous participant codes they generated for themselves and their partner in response to six questions. A sensitivity analysis with g*power (Faul et al., 2007) revealed that the sample was large enough to detect a small to medium sized correlation (r = .12) with a power of .80, at α = .05. As compensation for their time, couples with complete data from both partners were entered into a prize draw for one £50 Amazon voucher.

Measures - Perceived Similarity. Every rating of perceived similarity was preceded by a related measure. That is, before reporting their perceived value similarity, participants rated Schwartz et al.'s (2012) 19 value types in terms of their importance as guiding principles in their lives on a scale from -4 ("Opposed to my values") to +4 ("of supreme importance"), in a process similar to the Short Schwartz Value Survey (e.g., "How important is Stimulation (excitement, novelty, and change) as a guiding principle in your life?"; Lindeman & Verkasalo, 2005). They also rated 12 trait adjectives (e.g., "organised", "emotional"; Lee & Ashton, 2008) as values (Hanel & Maio, 2020) in terms of their importance as guiding principles (e.g., "How important is being emotional as a guiding principle in your life?"), using the same scale. Also, before reporting their perceived relationship ideal similarity, participants completed the relationship ideal scale by Fletcher et al. (1999). This scale asked them to rate abstract ideals (e.g., "passion", "equality") in terms of their importance to a thriving romantic relationship on a scale from -4 ("Opposed to the principles of a thriving romantic relationship") to 4 ("Of supreme importance for a thriving romantic relationship"). Finally, before reporting their perceived trait similarity, participants were asked to describe themselves using 12 adjectives from a list of HEXACO trait adjectives (Lee & Ashton, 2008) and rated the 19 value types as traits using Hanel and Maio's (2020) method, which presents the values as behaviourally descriptive statements (e.g., "I act in a way that promotes achievement"). All these trait items were answered on a scale from -4 (Strongly Disagree) to 4 (Strongly Agree).

Measures - Perceived Value Similarity. Participants responded to two items assessing their perceived value similarity: "Overall, my partner and I agree on what is important in life", and "I believe that my partner's values are similar to mine". Participants responded using a scale from 1 ("Disagree") to 6 ("Agree"). Responses to these items were

highly correlated (*r* = .69), and therefore averaged to provide an overall index (*M* = 4.99, *SD* = 0.88)

Measures - Perceived Relationship Ideal Similarity. Participants completed to two items regarding their perceived relationship ideal similarity: “Overall, I believe that my partner and I agree on what is important in a relationship”, and “I believe my partner’s relationship values are similar to mine”. Participants responded using a scale from 1 (“Disagree”) to 6 (“Agree”). Responses to these items were highly correlated (*r* = .71), and therefore averaged to provide an overall index (*M* = 5.19, *SD* = 0.83).

Measures - Perceived Trait Similarity. Participants were asked to respond to two items assessing perceived trait similarity: “Overall, my partner and I would act similarly in most situations”, and “I believe that my partner’s personality is similar to mine.” Participants responded using a scale from 1 (“Disagree”) to 6 (“Agree”). Responses to both items were highly correlated (r = .58), and therefore averaged to provide an overall index (*M* = 4.05, *SD* = 1.18).

Measures - Relationship Quality. Participants rated the quality of their relationship using the 18-item Perceived Relationship Quality Component questionnaire (PRQC; Fletcher et al., 2000). These items ask participants about the satisfaction, commitment, trust, intimacy, passion, and love they feel in their relationship. Each of these six components is assessed with three questions, and all questions are answered on a 7-point scale ranging from “Not at all (1)”, to “extremely (7)”. The overall measure of relationship quality (the average of all 18-items) exhibited excellent internal consistency (*α* = .93, *M* = 6.10, *SD* = 0.77).

Measures - Other Measures. The following measures were included for use in another project and will not be discussed further in this manuscript.

Relationship Adjustment and Commitment. We included seven items from the dyadic adjustment scale (DAS; Spanier, 1976), with 5 measuring areas of disagreements in the relationship, one being a single-item measure asking participants to rate the happiness in their relationship relative to most relationships on a 7-point scale (“Extremely unhappy” to “Perfectly Happy”), and the last one asking participants how they feel about their relationships future. We also included the single-item picture measure of inclusion of the other in the self (IOS; Aron et al., 1991). Results for both measures can be found in the supplementary materials. In brief, our principal findings partly replicate for the single-item happiness measure but not for the IOS. We address these differences and our reasons for focusing on the PRQC in the General Discussion.

Miscellaneous. Participants also answered 25 yes/no questions assessing self-monitoring (Snyder, 1974) and rated themselves and their partner in terms of physical attractiveness. These were included for ancillary research questions not relevant to this paper.

Procedure. After reading about the purpose of the study and giving informed consent, all participants generated their own and partner codes. They then either randomly received the measures in the predictor block (SSVS, HEXACO adjectives, values-as-traits, traits-as-values, relationship ideals, all perceived similarity measures, self-monitoring, and physical attractiveness) or the outcome measures (PRQC, DAS, and IOS). The order of all the measures within the blocks was also randomised, except that the perceived similarity measures always followed the relevant measures (i.e., traits, values, ideals). The order of items within each measure were also randomised. When both blocks were completed, participants answered demographic questions (age, gender, occupation, relationship duration, marital status, and parental status), had the opportunity to comment on the study, and were debriefed.

Results

The presence of couples in the data means that the assumption of independence for the outcome variable is not met. Neglecting such hierarchical structures in the data can lead to distorted results (Musca et al., 2011). We therefore used multilevel modelling and included a random intercept for each couple (as seen in Equation 14):

$$RQ_{ij} = \beta_0 + \beta_1 PS_{ij} + r_j + e_{ij} \quad (14)$$

where *RQ* is the relationship quality of person *i* within couple *j*, *PS* is their perceived similarity score, and *r* is the extent to which the intercept of couple *j* varies from the overall intercept β_0. In these models, the effect of perceived similarity (β_1) is equal for all couples (and thus fixed), while the couples themselves are allowed to differ based on their common relationship quality, thus controlling for nonindependence in the data. All participants whose partner did not participate were coded as a couple with just one member and received their own intercept. All predictors and outcomes were z-standardised to produce standardised β coeffcients, which are an appropriate way to estimate and compare the size of fixed effects in multi-level models (Lorah, 2018).

To find the most relevant dimension of perceived similarity, we computed six models resulting from having the three dimensions predict relationship quality in all possible combinations. We used the *nlme* package to fit multilevel models in R (Pinheiro et al., 2020). To enable the comparison of multilevel models with different fixed effects, we fitted the models to maximum likelihood instead of restricted maximum likelihood (REML; Gurka, 2006). Because these comparisons are often very liberal, we report the change in β-coefficients as a conditional way of viewing fixed effects (Pinheiro & Bates, 2000).

The 174 couples were highly interdependent in terms of their relationship quality (*ICC(1)* = .62, *p* < .001, *95% CI* = [.52; .71]), justifying our use of multilevel models to control for this interdependence. Results for the hierarchical model comparisons can be seen in Table 13. When predicting relationship quality alone, all three dimensions of perceived similarity were significant, positive predictors (Table 13, row 3). Showing the individual importance of similarity in the three dimensions, all three were significant predictors in the omnibus model including all perceived similarity dimensions (Table 13, row 7). Perceived value similarity (β(171) = .23, p < .001, 95% CI = [.15; .31]) was a marginally stronger predictor of relationship quality than perceived trait similarity (β(171) = .19, p < .001, 95% CI = [.11; .27]) in the two-predictor model were both were present. However, perceived trait similarity (β(171) = .19, p < .001, 95% CI = [.11; .27]) was substantially weaker than perceived relationship ideal similarity (β(171) = .29, p < .001, 95% CI = [.21; .37]) when both predictors were present.

Table 13

Hierarchical regression model comparisons of perceived similarity dimensions predicting relationship quality (N = 535)

	β		
	Values	**Ideals**	**Traits**
Zero model	.32*** [.24;.39]	.36*** [.29;.44]	.28*** [.21;.35]
Two Predictor Models			
+ Values	-	.27*** [.19;.35]	.19*** [.11;.27]
+ Ideals	.20*** [.11;.28]	-	.19*** [.11;.27]
+ Traits	.23*** [.15;.31]	.29*** [.21;.37]	-
Full model	.14** [.05;.23]	.24*** [.16;.32]	.15*** [.07;.23.]

Note. Rows indicate the predictor related to β coefficients in different models indicated by rows. Values in brackets represent the 95% confidence interval. Ideals = relationship ideals.

Discussion

This study conducted the first direct comparison of perceived similarity in different dimensions when predicting the quality of romantic relationships. The correlations and hierarchical multilevel analyses revealed that each dimension of perceived similarity (values, relationship ideals, and traits) predicted relationship quality. At the same time, these analyses revealed that perceived relationship ideal similarity was consistently the strongest predictor, and perceived trait similarity was consistently the weakest predictor.

It is also interesting that perceived value similarity and perceived relationship ideal similarity shared a lot of variance when predicting relationship quality. This shared variance is evident in the steep drops from their respective zero-models to the beta-coefficients when both variables were entered into the regression. The results from this analysis hint at the possibility that perceived values similarity and perceived relationship ideals similarity relate to relationship quality through a shared process, potentially signalling similarity and support in personal or relationship goals. Such a process would support the framework we propose and is investigated further in Studies 2 and 3.

Study 2 – Replication and Causal Investigation in a Longitudinal Sample

Study 1 revealed differences in the extent to which perceived similarity in values, relationship ideals, and traits are associated with the quality of the romantic relationships. To follow-up these findings, Study 2 tested whether perceived value similarity and perceived relationship ideal similarity are stronger predictors of relationship quality than perceived trait similarity (H1). Further, we tested for direct cross-lagged connections of perceived similarity to relationship quality (H2), and tested whether there would either be a stronger effect of perceived similarity on relationship quality (bottom-up; H3a) or a stronger effect of relationship quality on perceived similarity (top-down; H3b). The study was part of a preregistered project on actual and perceived personality similarity in romantic relationships (https://osf.io/tpzk7).

Methods

Participants. We received 630 responses (177 couples and 276 individuals) for a longitudinal study on personality similarity in romantic relationships (Litzellachner et al., 2020a). We excluded 53 individuals from analyses for completing the survey in less than 10 minutes (a preregistered exclusion criterion), 6 individuals for having repetitive or random response patterns (detected by visual inspection), 9 individuals for double-entry (using the same e-mail address), and 4 couples (8 individuals) for having identical answers in all measures with another participant. We further excluded 118 responses we believe to be

fraudulent. We received these after posting study advertisements on social media. These responses were all completed in rapid succession, with e-mail addresses all using the schema of [*firstname].[lastname][numbers]@gmail(or yahoo).com,* where the names did not match the initials from the self-generated code (which these participants generated to be matched to their partners, like the participants in Study 1). Thus, our final sample at T1 included 436 individuals (148 couples, 140 individuals; M_{age} =23.92, SD_{age} = 6.36; average relationship duration = 38.13 months, *SD* = 48.97 months).

We invited the participants to answer three questionnaires over the span of 8 months. Across waves, participants were identified through the same anonymous participant codes used in Study 1. Due to our interest in dyads (see Litzellachner et al., 2020a), only matched couples were invited for further waves. Four months after completing the first questionnaire (i.e., at T2), 211 participants completed the same questionnaire again. After 2 participants were excluded for completing the survey under 10 minutes, the valid sample at T2 comprised 209 individuals (94 couples and 23 individuals; M_{age} = 24.01, SD_{age} = 6.81, average relationship duration at T2 = 43.23 months, *SD* = 47.90 months). Eight months after completing the initial questionnaire (i.e., at T3), all T1 participants were invited again, and 193 individuals responded. After excluding 2 participants for completing the survey in under 10 minutes, the valid T3 sample was 191 individuals (85 couples and 21 individuals; M_{age} = 24.86, SD_{age} = 7.25, average relationship duration at T3 = 47.05 months, *SD* = 46.88 months). For comparisons between T2 and T3, we had valid data from 173 individuals (76 couples and 21 individuals, M_{age} = 24.86, SD_{age} = 7.25, average relationship duration at T3 = 47.65 months, *SD* = 47.50 months). Thus, at the final wave, the sample was large enough to detect small effect sizes in correlations (r = .21) at α = .05 with 80% power (calculated with G*Power; Faul et al., 2007). For their participation in the study, everyone in a couple received £1 for completing the questionnaire at T1, £2 for T2, and £4 for T3.

Measures. Descriptive statistics and reliabilities for all measures are shown in Table 14.

Perceived Similarity. The process of measuring perceived similarity was similar to Study 1. Participants indicated their similarity towards their partner after completing a relevant measure of either values, relationship ideals, or traits. The perceived similarity questions were identical to those used in Study 1. While the measure of relationship ideals completed by participants was the same measure used in Study 1 (the PRQC; Fletcher et al., 1999), there was a change in the value and trait measures. For this study, we included only 35 items assessing the higher-order value types of self-transcendence and conservation in the Schwartz Value Survey (SVS; Schwartz, 1992) and asked about their

importance as abstract ideals (e.g., “How important is being Devout (holding to religious faith and beliefs) as a guiding principle in your life?”) and their descriptiveness of behavioural tendencies (e.g., “I am Devout (holding to religious faith and beliefs)”), because we had by this point obtained other evidence that these values were particularly important in relationship quality (Litzellachner et al., 2020b; van der Wal et al., 2020). This was the same procedure to rephrase values-as-traits described in Study 1 (Hanel & Maio, 2020). Responses for both values and traits were measured on a 11-point scale ranging from -5 (values: “Extremely opposed to my values”; traits: “Very strongly disagree”) to 5 (values: “Extremely important”; traits: “Very strongly agree”).

Table 14

Descriptive statistics for all variables in all waves of Study 2

		Perceived Similarity			RQ	Commitment
		Values	Ideals	Traits		
T1	*M* (*SD*)	4.86 (0.96)	5.15 (0.88)	4.14 (1.17)	6.95 (0.81)	5.91 (0.76)
	r	.66	.74	.63	.94	.80
T2	*M* (*SD*)	4.83 (0.83)	5.07 (0.90)	4.23 (1.07)	6.88 (0.80)	5.97 (0.67)
	r	.69	.78	.64	.94	.80
T3	*M* (*SD*)	4.85 (0.86)	5.06 (0.78)	4.29 (1.10)	6.83 (0.89)	6.00 (0.70)
	r	.73	.73	.62	.95	.80

***Relationship Quality*.** Participants responded to the same 18-items of the PRQC (Fletcher et al., 2000) on a scale from 1 (not at all) to 8 (extremely).

***Other Measures of Relationship Quality*.** As in Study 1, we also included the IOS and two of the DAS items (a single-item measure of relationship happiness and the item presenting statements about the future of their relationship). Additionally, Study 2 also included a 10-item measure of relationship commitment (Lund, 1985). We also included the positive and negative relationship quality scale (PNRQ; Fincham & Rogge, 2010), but only at T3 (positive relationship quality: α = .89; negative relationship quality: α = .77). Although

these measures were presented for use in another project, we include results for these in the supplementary materials[7].

Procedure. To encourage participant retention across waves, we sent couples articles about relationship science from the website www.luvze.com before every wave (before T2: Dowlat, 2018; before T3: Lewandowski, 2015). We subsequently asked participants whether they had read the article. The procedures were identical at every wave. The blocking and randomisation of items was similar to Study 1, with a predictor block (SVS, values-as-traits, relationship ideals, and perceived similarity measures) and an outcome block (except for wave 3, where the PNRQ was added). The demographic questions at the end of each wave were also identical to Study 1.

Analysis. To replicate the analyses in Study 1, we conducted hierarchical regressions within each wave. For the longitudinal comparisons, cross-lagged models were computed, where a later instance of one variable (e.g., relationship quality at T2) was predicted by the earlier instance of another variable (e.g., perceived value similarity at T1) controlling for the earlier instance of the outcome variable (e.g., relationship quality at T1), thus modelling change as a product of the earlier state of the outcome variable, plus the predictor variable. As in Study 1, we used multilevel models, with a random intercept for each couple and each partner-less individual (Equation 15):

$$RQ_{ij_{T+1}} = \beta_0 + \beta_1 Sim_{ij_T} + \beta_2 RQ_{ij_T} + r_j + e_{ij} \quad (15)$$

where the subscript *T* denotes the point of measurement (In the *RQ* term, *T*+1 would be replaced by *T*+2 in comparisons between T1 and T3.). The parameter of interest here is β_1 which can either show the effect of perceived similarity on changes in relationship quality, as in Equation 15, or the effect of relationship quality on changes in perceived similarity, as in Equation 16:

$$Sim_{ij_{T+1}} = \beta_0 + \beta_1 RQ_{ij_T} + \beta_2 Sim_{ij_T} + r_j + e_{ij} \quad (16)$$

[7] Cross-sectional and longitudinal analysis show very similar patterns for all outcome measures except for the IOS. The longitudinal analysis shows more bottom-up effects when the single-item happiness measure is used, and no longitudinal effects when the IOS is used.

To estimate which causal direction is stronger, we compared the strength of β_1 obtained from Equation 15 (henceforth referred to as $\beta_{\uparrow}$, as it denotes the natural strength of the bottom-up, similarity-attraction hypothesis), to the strength of β_1 obtained from Equation 16 (henceforth referred to as $\beta_{\downarrow}$, as it denotes the strength of the top-down, attraction-similarity hypothesis) obtained within one wave gap (T1-T2, T2-T3, and T1-T3).

To ascertain which parameter is stronger, we used bootstrapping. We drew 5000 random subsamples from the eligible sample for each comparison. In each subsample, we estimated the models of Equation 15 and 16 for each dimension of perceived similarity and extracted $\beta_{\uparrow}$and $\beta_{\downarrow}$. We used these coefficients to calculate the parameter of interest, namely the difference between these two parameters (Equation 17):

$$\beta_{\uparrow\downarrow} = \beta_{1\uparrow} - \beta_{1\downarrow} \quad (17)$$

Given that we did not predict a specific direction of influence, testing was two-sided. Out of 5000 subsamples, more than 4875 (97.5%) needed to show a uniformly positive value of $\beta_{\uparrow\downarrow}$, showing the bottom-up direction to be stronger, or a uniformly negative value of $\beta_{\uparrow\downarrow}$, showing the top-down direction to be stronger, equivalent to $p < .05$.

Results

Hierarchical Regression. Couples were highly interdependent at all three time points ($ICC(1)_{T1}$ = .64, $ICC(1)_{T2}$ = .52, $ICC(1)_{T3}$ = .47; all $p < .001$), necessitating the use of multilevel models. Cross-sectional hierarchical regressions are shown in Table 15. As in Study 1, there were significant positive zero-order correlations between all dimensions of perceived similarity and relationship quality, with perceived value similarity (T1: r(433) = .25, T2: r(206) = .42, T3: r(183) = .43, all $p < .001$) and perceived relationship ideal similarity (T1: r(433) = .34, T2: r(206) = .58, T3: r(183) = .55, all $p < .001$) consistently showing stronger correlations than perceived trait similarity (T1: r(433) = .16, T2: r(206) = .36, T3: r(183) = .31, all $p < .001$). In the multilevel models, all dimensions of perceived similarity were positively related to relationship quality when predicting the outcome alone at all three time points.

Confirming our hypothesis, trait similarity consistently showed the weakest association with relationship quality. Moreover, when perceived trait similarity was entered first, both perceived values similarity and perceived relationship ideal similarity explained variance above perceived trait similarity. However, perceived trait similarity did not explain

Table 15

Hierarchical regression β coefficient change when inserting different dimensions of perceived similarity predicting relationship quality

	T1 (*N* = 436)			T2 (*N* = 208)			T3 (*N* = 189)		
	Values	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**
Zero Model	.23** [.13; .31]	.29*** [.20; .37]	.12** [.03; .21]	.39*** [.26; .51]	.52*** [.41; .63]	.34*** [.21; .47]	.43*** [.30; .56]	.52*** [.40; .65]	.31*** [.17; .45]
Two-Predictor Models									
+ Values	-	.24*** [.13; .34]	.03 [-.07; .12]	-	.43*** [.31; .57]	.19* [.05; .33]	-	.40*** [.25; .55]	.10 [-.06; .26]
+ Ideals	.09^{t} [-.01; .19]	-	.03 [-.06; .12]	.16* [.03; .29]	-	.15* [.03; .28]	.20** [06; .35]	-	.10 [-.04; .24]
+ Traits	.21*** [.11; .31]	.28*** [.19; .37]	-	.30*** [.16; .44]	.46*** [.34; .57]	-	.37*** [.21; .53]	.48*** [.34; .61]	-
Full Model	.09^{t} [-.02; .20]	.23*** [.12; .34]	.00 [-.09; .10]	.12 [-.02; .26]	.41*** [.28; .54]	.11 [-.02; .25]	.19* [.03; .36]	.40*** [.25; .55]	.03 [-.12; .18]

Note. Rows indicate the predictor related to β coefficients in different models indicated by rows. Values in brackets represent the 95% confidence interval. Ideals = relationship ideals.

$^{t}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$

Table 16

Cross-lagged models for all perceived similarity dimensions and relationship quality

	T1-T2 (*N* = 209)				T2-T3 (*N* = 189)				T1-T3 (*N* = 175)			
	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*
Values	.03 [-.07; .13]	.591	.21 [.09; .34]	.001**	-.00 [-.11; .11]	.851	.16 [.01; .30]	.040*	.08 [-.04; .20]	.210	.21 [.07; .35]	.004**
Ideals	.16 [.06; .27]	.002**	.16 [.03; .29]	.015*	-.00 [-.13; .12]	.978	.20 [.03; .36]	.024*	.04 [-.08; .16]	.502	.36 [.22; .49]	< .001***
Traits	.07 [-.03; .16]	.197	.14 [.02; .25]	.016*	.01 [-.09; .11]	.948	.13 [-.00; .26]	.051[t]	.05 [-.07; .17]	.452	.16 [.03; .28]	.016*

Note. The $\beta_{\uparrow}$ column shows coefficients for earlier perceived similarity predicting changes in relationship quality, while the $\beta_{\downarrow}$ column shows coefficients for earlier relationship quality predicting changes in perceived similarity. Values in brackets represent the 95% confidence interval.

Table 17

Stability and bootstrapping for all dimensions of perceived similarity and relationship quality

	T1-T2 (*N* = 209)				T2-T3 (*N* = 189)				T1-T3 (*N* = 175)			
	$r_{1\text{-}2}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-	*p*	$r_{2\text{-}3}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-	*p*	$r_{1\text{-}3}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-.	*p*
Values	.49	55	4945	.022*	.52	419	4581	.168	.43	605	4395	.242
Ideals	.52	2498	2502	.999	.50	581	4419	.232	.35	4	4996	.002**
Traits	.61	476	4524	.190	.60	861	4139	.344	.57	394	4606	.158

Note. All comparisons were made with 5000 iterations. The $\beta_{\uparrow\downarrow}$+ column shows the number of iterations in which the standardised coefficient of perceived similarity predicting changes in relationship quality was higher than the standardised coefficient of relationship quality predicting changes in perceived similarity. The $\beta_{\uparrow\downarrow}$- column shows the number of iterations in which the standardised coefficient of relationship quality predicting changes in perceived similarity was higher than the standardised coefficient of perceived similarity predicting changes in relationship quality. All p-values are two-sided. Stability values for relationship quality were $r_{1\text{-}2}$ = .71, $r_{2\text{-}3}$ = .76, $r_{1\text{-}3}$ = .61.

variance above perceived similarity in values or relationship ideals, except at T2, where perceived trait similarity explained variance above both individual predictors. Both perceived value similarity and perceived relationship ideal similarity explained marginal or significant amounts of variance beyond each other in models that did not include perceived trait similarity. When entered in the last step, only perceived relationship ideal similarity significantly explained variance above the two other predictors at every point. Perceived value similarity explained individual variance above the other two predictors only at T3.

Cross-Lagged Model. First, we tested whether reading the articles on relationships influenced our results by modelling changes in relationship quality from having read the relationship article we sent out. There was neither an effect between T1 and T2 (β = -.09, *p* = .264) nor between T2 and T3 (β =.00, *p* = .980). Cross-lagged model comparisons showed evidence for both a bottom-up similarity-attraction and a top-down attraction-similarity effect (Table 16). In favour of the bottom-up hypothesis, higher perceived similarity in relationship ideals predicted increases in relationship quality over four months from T1 to T2. In favour of the top-down hypothesis, higher relationship quality significantly predicted greater perceived similarity between all-time lags apart from one (T2-T3) which barely missed the .05-threshold.

A similar pattern of longitudinal associations was revealed by our bootstrapping analysis (Table 17). These showed two instances where relationship quality was a stronger predictor of changes in perceived similarity than vice-versa. Over four months, the top-down pathway was stronger than the bottom-up pathway for values. Over eight months, the same

pattern occurred for relationship ideals. Overall, then, there was stronger evidence for a connection from relationship quality to similarity than vice-versa.

Discussion

With this study, we tested whether the findings of Study 1 replicate and whether the relationship between perceived similarity and relationship quality over time is more likely to follow one specific bottom-up (i.e., similarity-attraction; Byrne et al., 1971) or top-down (i.e., attraction-similarity; Morry, 2005) causal route. In line with our predictions, we found again that perceptions of perceived value similarity or perceived relationship ideal similarity showed stronger connections to relationship quality than trait similarity. Perceived relationship ideal similarity was an especially strong predictor of relationship quality, both within and sometimes across waves. While we found some evidence for both the bottom-up and the top-down pathway, the overall pattern and our bootstrapping analysis revealed the top-down pathway to be stronger. In fact, relationship quality predicted changes in perceived similarity in almost all instances. The only exception to this pattern emerged when relationship quality was used to predict changes in perceived trait similarity from T2 to T3, perhaps due to the lesser connection of perceived trait similarity to relationship quality. Overall, the associations over time indicated that perceptions of similarity in relationship ideals influence relationship quality, but perceptions of similarity are more likely to be influenced by relationship quality overall.

It is interesting that perceived relationship ideal similarity exhibited an equally strong cross-lagged relationship with relationship quality over the short interval (T1-T2), but afterward was significantly more likely to be the consequence of relationship quality than its cause. Viewed in retrospect, this pattern for relationship ideals aligns with Morry's (2005) suggestion that perceived similarity is important for creating relationship quality at early stages, but that relationship quality then predicts perceptions of similarity on the long run. Because perceived relationship ideal similarity was the only predictor to predict changes in relationship quality between waves, it is plausible that perceptions of similarity in this dimension have a unique connection to relationship quality.

Furthermore, given that the other two perceived similarity variables lose explanatory power whenever perceived similarity in relationship ideals is entered into the model, this connection with relationship ideals may partly subsume the effects of perceived value and trait similarity, although perceived value similarity can have an independent effect. Perceived trait similarity only has a general link to relationship quality, potentially as a consequence of lay beliefs about the importance of similarity (Morry, 2005). Because the value and relationship ideal dimensions explain independent variance in relationship quality,

their connection goes beyond the universal effect of lay beliefs, through signalling goal similarity and goal support. This inference was tested in Study 3.

Study 3 – Goal Support as a Mechanism

Given the evidence from Studies 1 and 2, Study 3 focused on perceived similarity between values and relationship ideals and examined the mechanisms through which both might influence relationship quality. Specifically, we tested whether perceived similarity in values and relationship ideals shape perceived goal support from relationship partners and whether the effect is moderated by goal context.

This test entailed moderated mediation analyses examining whether a direct effect (*c*) of perceived similarity (*X*) on relationship quality (*Y*) would be explained – fully or partly – by the indirect effect (*ab*) – the product of the effect (*a*) of perceived similarity on goal support (*M*), and the independent effect (*b)* of the goal support on relationship quality after controlling for perceived similarity. They also tested whether this indirect effect will be weaker in the personal context (personal values – personal goal support), than in the relationship context (relationship ideals – relationship goal support).

However, moderated mediation might also arise through a different mechanism, because receiving partner support might be more important for some goals than for others. While Fitzsimons et al. (2015) states that "TGD … is without goal content, making no assumptions about what particular goals partners pursue. Transactive gain/loss could be conceptualized for any subset of goals of interest" (p. 17), the eudaimonic theory of marital quality (Fowers & Owenz, 2010) emphasizes the added meaningfulness of shared goal pursuit over individual goal pursuit. The eudaimonic theory defines shared goals as goals that are pursued together with inherently shared outcomes. Because this description fits relationship goals but not personal goals, we will test whether goal context also moderates the connection of goal support to relationship quality (Figure 15; Hayes, 2013, model 58).

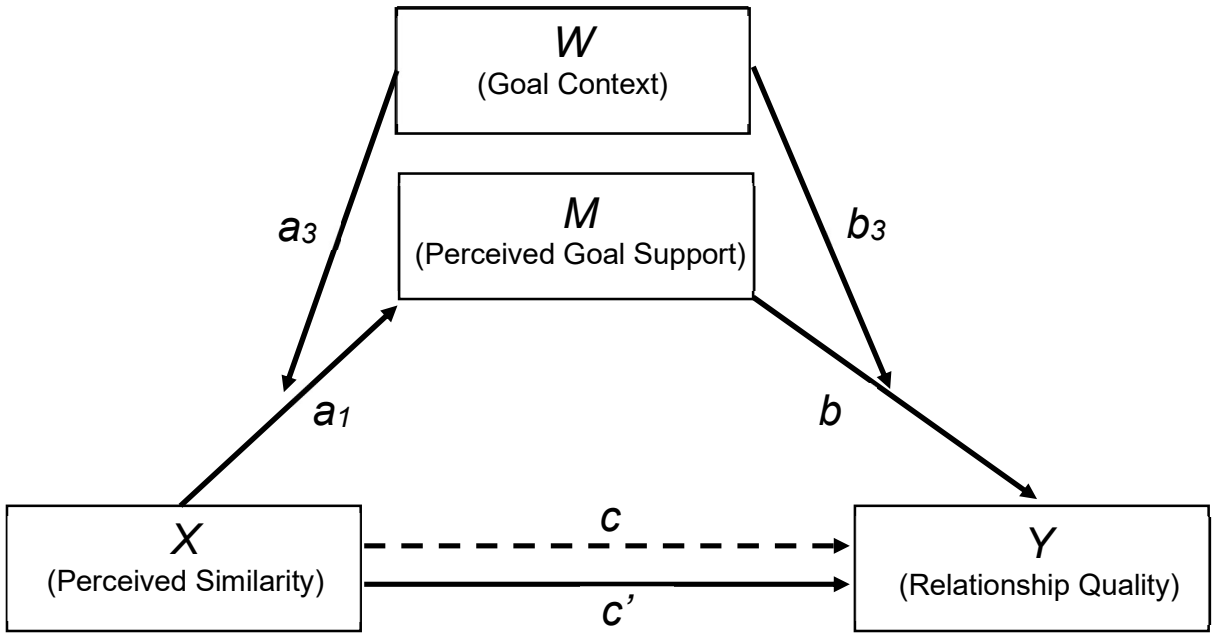
Method

Participants. Optimal sample sizes (N_{opt} = 200 per group) were calculated in R using Monte Carlo simulations based on Hayes's (2013) model 58 with pre-set effect sizes[8] estimated from the most conservative estimates found in other research (Avivi et al., 2009; Brunstein et al., 1996; M. Kaplan & Maddux, 2002; Preotu & Turliuc, 2013) and Study 1 and 2. The R-script for these calculations can be found in the online supplementary materials.

[8] Personal context: r_a = .40, r_b = .34, , $r_{c'}$ = .00; Relationship context: r_a = .63, r_b = .60, , $r_{c'}$ = .00;

Figure 15

Hayes's model 58



Note. The indirect effect for any level of *W* is calculated by summing up the effect a_1 and the interaction of XW a_2 (multiplied by the level of W), and multiplying it by the sum of b_1 (which is the effect of M on Y controlling for X) and the interaction of MW b_2 (also controlling for X) predicting Y (multiplied by the level of W).

$$ab_W = (a_1 + a_3W)(b_1 + b_3W)$$

Using the online recruitment platform Prolific, we recruited 525 participants who had been in committed romantic relationships for more than three months. After excluding 54 individuals for failing an instructed response attention check (Kung et al., 2018), 12 individuals because they did not complete anything other than the outcome measures, and 4 individuals for reporting relationships that have lasted for fewer than three months, the final sample included 455 participants (207 men, 240 women, 8 missing: M_{age} = 32.20, *SD* = 10.27, average relationship duration = 95.62 months, SD = 96.73 months). Of the remaining couples, 24 indicated being in a same-sex relationship. Participants were randomly allocated to either a personal goal context or a relationship goal context. Participants in the personal goal context received questions regarding values, personal goals, and relationship quality (*N* = 225), whereas participants in the relationship goal context group received questions regarding relationship ideals, relationship goals, and relationship quality (*N* = 230). For their 15-minutes of participation, participants received £1.50.

Measures - Perceived similarities. The procedure for measuring perceived value similarity and perceived relationship ideal similarity was identical to Study 1. Participant's completed the perceived similarity measures after completing the SSVS (Lindeman & Verkasalo, 2005) in the personal goal context group, or the relationship ideal scale (Fletcher et al., 1999) in the relationship goal context group. Both measures were rated on a scale from -1 ("Opposed to my values"/ "Opposed to the principles of a thriving romantic relationship") to 7 ("Of supreme importance"/ "Of supreme importance for a thriving romantic relationship"). Thereafter participants rated their partner's similarity to themselves in the values/ideals with two questions for either dimension using the same items as in Studies 1 and 2 (values: α = .91, *M* = 4.88, *SD* = 1.08; ideals: α = .89 , *M* = 5.09, *SD* = 0.99).

Measures - Attention check. Both the SSVS and the relationship ideals scale included an instructed response attention check (Kung et al., 2018). Both questions stated, "to indicate that you are paying attention, please select (Not important, 0) for this question".

Measures - Goal Listing Process. Questions about goals were similar to those used by Brunstein et al. (1996). Participants listed either three personal goals or three relationship goals, depending on their assigned condition. These questions were used to construct scores for goal similarity, an exploratory measure of perceived transactive density (or perceived interdependence), and goal support.

In the personal goal condition, we asked participants to "think about an important personal, individual goal of yours and write it down in a few sentences in the box". To make a clear distinction from relationship goals, text in bold reminded participants that "personal goals should NOT include or refer to the relationship with your partner". We also defined relevant goals as "objectives, plans, and projects that you have pursued lately and intend to work on intensively in the following weeks", while providing examples, such as "work, career, or academic pursuits, relatives or friends, leisure time or personal growth". Example answers from participants include "starting to write my book", "continue my transition to pescatarian", and "working more in my business".

Measures - Goal Similarity. After every personal goal that participants noted, they completed a measure of perceived goal similarity: "My partner is currently pursuing a personal goal that is similar to mine", to which they responded using a scale from -3 (Completely disagree) to 3 (Completely agree). The goal similarity score was the average of the answers to this question across all three listed goals (*M* = 0.53; *SD* = 1.33).

Measures - Transactive Density. This item was followed by a measure of perceived transactive density: "How important is it for YOUR PARTNER, that YOU achieve

this goal?", to which they responded using the same 9-point scale (-1 to 7;) as used for their own values and ideals. This item was added for additional exploratory analyses which the present paper will not discuss.

Measures - Perceived Goal Support. Finally, following Brunstein et al. (1996), participants rated the degree of partner support they have received in terms of opportunity ("My partner provides opportunity for me to work on this goal"), understanding ("My partner shows a lot of understanding for this goal"), and assistance ("My partner reliably assists me in attempts to accomplish this goal"). We also included a question about collaboration, similar to Avivi et al. (2009; "My partner and I are working together collaboratively to accomplish this goal"), and one about communication, similar to the question in Preotu and Turliuc (2013; "My partner and I are discussing and talking about me pursuing this goal"). For each of the three goals, participants responded to these five questions on a scale from -3 (Completely disagree) to 3 (Completely agree), and the average of all 15 items comprised the perceived goal support score (α = .91, *M* = 1.36, *SD* = 1.04).

The goal listing process was similar for both conditions. The relationship context group differed in that we asked those participants to think about "an important relationship goal of yours", reminding them that it "MUST include or refer to the relationship with your partner". The rest of the definition of a relevant goal was identical to the personal goal condition. However, the examples provided for this group included: "relationship maintenance and future plans, intimacy and mutual trust, passion or sexual attraction". Example answers from participants were: "To not get personal stress into our relationship", "to have a dream wedding", and "rebuilding the intensity and passion of our relationship". The similarity questions (*M* = 1.80; *SD* = 0.99), the perceived transactive density question (*M* = 5.40, *SD* = 1.24) and the relationship goal support questions (α = .94; *M* = 1.72, *SD* = 0.96) were identical to the personal goal questions, but referred to relationship goals.

Measures -Relationship quality. The 18-item PRQC (Fletcher et al., 2000) was identical the measure used in Study 1 (α = .96, *M* = 5.74, *SD* = 0.96).

Measures - Additional relationship quality measures. After the PRQC, participants completed one item from the dyadic adjustment scale (Spanier, 1976) regarding the future of their relationship, the IOS item (Aron et al., 1992), and the PNRQ (Fincham & Rogge, 2010). Results substituting those measures for the PRQC can be found in the OSM. Results were generally consistent across outcome measures.

Procedure. After being randomly assigned to either the personal (i.e., values and personal goals) or relationship (i.e., relationship ideals and relationship goals) context group,

participants were first shown either the predictor and mediator block or the outcome block. While the order of the blocks was randomized, the order of the questionnaires within each block was fixed. The block with the predictor measures consisted of the measure of values or relationship ideals, followed by the relevant measure of perceived similarity. After completing this section, participants were asked to list the first important personal or relationship goal in two short sentences. After listing the goal, participants were asked to rate their partner's goal similarity, the transactive density and the amount of partner goal support they perceived for this goal. Participants repeated this procedure for the goals two more times, listing "another one" of their important goals and then "a third" important goal. This process was identical for both goal context groups.

The outcome measures block consisted of (in fixed order) the PRQC, the item from the Dyadic Adjustment Scale, the Inclusion-of-the-Other-in-the-Self item, and the positive and negative relationship quality questions.

After completing both of these sections, participants responded to the same demographic questions as in Studies 1 and 2 and received debriefing information.

Results

Assumption checks. We examined whether the random assignment to personal or relationship goal contexts influenced the participants' relationship quality. A Welch independent samples t-test showed that neither group reported a significantly higher relationship quality than the other (personal goal context group: $M = 5.71$, $SD = 1.05$; relationship goal context group: $M = 5.77$, $SD = .87$), $t(428.82) = -.68$, $p = .500$.

Mediation Models. For all mediation analyses, we combined the two groups, pooling their perceived value similarity and perceived relationship ideal similarity into a single perceived similarity variable. In addition, we combined goal similarity, transactive density, and goal support from the respective contexts into one variable each. To test the differences of the indirect effect *ab* given different levels of *W*, we used bootstrapped confidence intervals of the difference between the standardized indirect effects (*ab*). In line with Hayes's (2013) model 58, we calculated the following for each one of 5000 iterations (Equation 18):

$$Diff_{ab} = ab_{W_1} - ab_{W_2} \tag{18}$$

where $ab_{W_i}$is defined in Equation 19 for Hayes's (2013) model 58 :

$$ab_{W_i} = (a_1 + a_3 W_i)(b_1 + b_3 W_i) \tag{19}$$

Alternatively, we aimed to use Equation 20 if there were no interaction of perceived goal support and goal context, calculating the indirect effect for Hayes's (2013) model 7:

$$ab_{W_i} = (a_1 + a_3 W_i) b_1 \quad (20)$$

where a_1 is the overall standardized effect of general perceived similarity on general perceived goal support, a_3 is the standardized effect of the interaction of perceived similarity and goal context on general perceived goal support, W_i is the goal context (with *i* = 1 for personal context and i = 2 for relationship context), b_1 is the standardized effect of general perceived goal support on relationship quality, controlling for the effects of general perceived similarity, and b_3 is the standardized effect of the interaction of general perceived goal support and goal context on relationship quality.

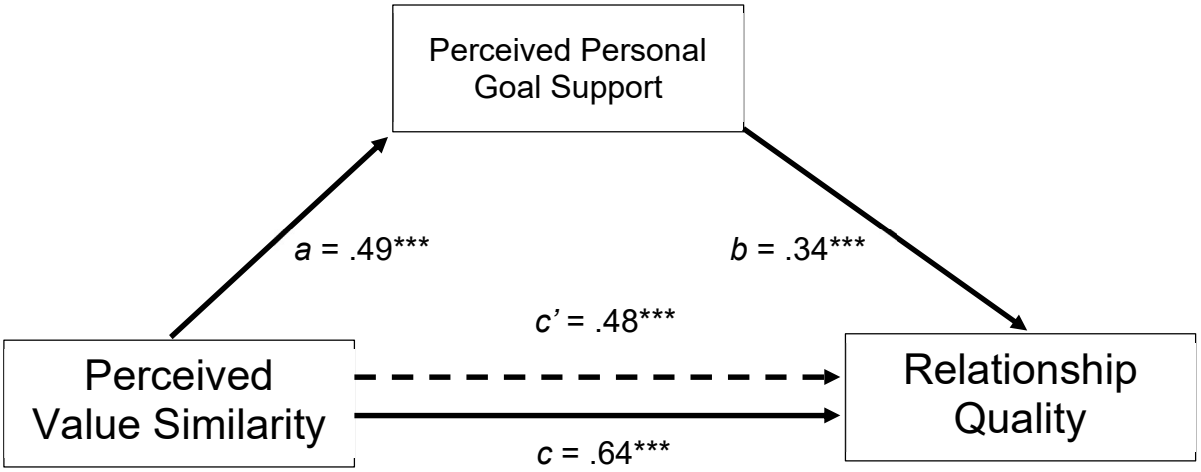
Correlations of all variables in the analysis are shown in Table 16. Contrary to our previous findings, both dimensions of perceived similarity showed almost equally strong correlations with relationship quality. However, perceived values similarity was less related to perceived personal goal support than relationship ideal similarity was related to perceived relationship goal support. In turn, perceived relationship goal support had a marginally stronger connection than perceived personal goal support to relationship quality. Consistent with our framework, both perceived value similarity, and perceived relationship ideal similarity related to relationship quality through perceived goal support (Figure 16 and 17). However, in both cases mediation was only partial, showing that perceived goal supp ort does not account for the entire similarity-quality link.

With regard to moderated mediation, Figure 18 shows the full results for the hypothesized model (Hayes, 2013, model 58). On the a-path, the interaction between perceived similarity and the goal context (personal vs. relationship) was marginally significant, β_{aW} = .07, *p* = .059, 95% *CI* = [-.01 ;.15] giving (due to the one-directional nature of our hypothesis) some, but limited support to our hypothesis (H5) that perceived value similarity would show a weaker connection to personal goal support than perceived relationship ideal similarity would show to relationship goal support. On the b-path, against the alternative predictions of the eudaimonic theory, the unique effect of the interaction between goal support and goal context was non-significant, β_{bW} = -.03, *p* = .737, 95% *CI* = [-.10; .03]. This evidence supports the TGD notion that goal content does not inherently influence the effect of transactive gains on relationship quality.

Lastly, we used bootstrapping to compare the indirect effects between the two contexts. Because of the non-significant interaction between goal support and goal context, we modelled Hayes's (2013) model 7. Contrary to our predictions, the moderation of *W* on

Figure 16

Simple mediation model of the variables in the personal context (N = 223)

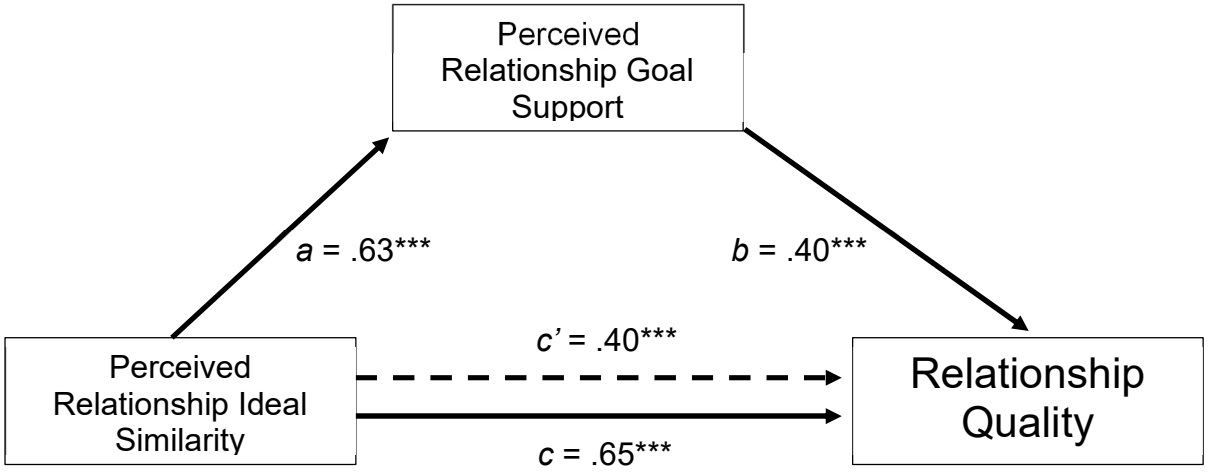


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure 17

Simple mediation model of the variables in the relationship context (N = 227)



Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Table 18

Zero-order correlation coefficients for all variables in the analysis

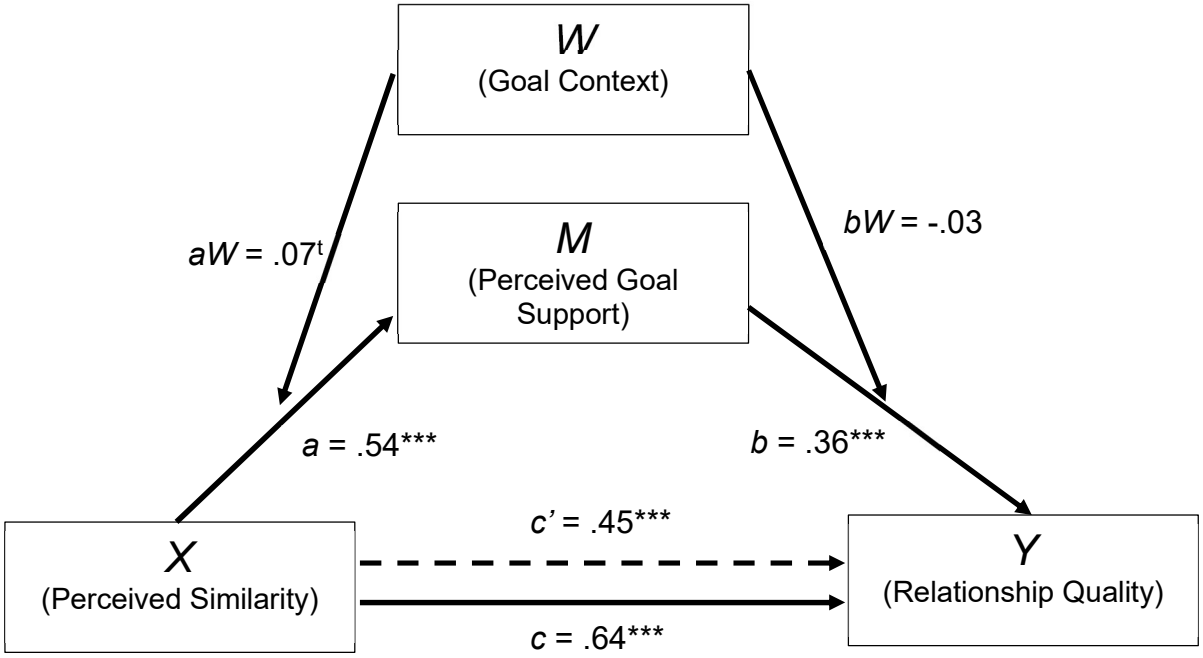
	Perceived Similarity	**Goal Sim.**	**Goal Support**	Perceived Val. Sim.	Perceived Rel. Ideal Sim.	Personal Goal Sim.	Relationship Goal Sim.	Personal Goal Support	Relationship Goal Support
Perceived Similarity	-	.36*** [.28, .44]	.55*** [.48, .62]	-	-	.20** [.07,.33]	.58*** [.48, .66]	.48*** [.37, .57]	.63*** [.54, .70]
Goal Sim		-	.61*** [.54, .66]	.20** [.07,.33]	.58*** [.48, .66]	-	-	.45*** [.34, .55]	.82*** [.78, .86]
Goal Support.			-	.48*** [.37, .57]	.63*** [.54, .70]	.45*** [.34, .55]	.82*** [.78, .86]	-	-
RQ	.64*** [.59, .69]	.31*** [.22, .39]	.60*** [.54, .66]	.64*** [.56, .71]	.65*** [.57, .72]	.17** [.04, .30]	.58*** [.48, .66]	.57*** [.48, .65]	.65*** [.57, .72]

Note. Cells with a "–"contain the autocorrelation of the variable. The variables highlighted in bold are stacked scores, consisting of values from both goal contexts. Therefore, it is not possible to, for example, correlate perceived value similarity and overall perceived similarity, as for every person who has received a personal context questionnaire, the two scores will be identical, and the same goes for people who have received a relationship context questionnaire. Correlations of aggregated variables with single context variables reflect the correlation of the two single context variables. For example, the correlation of "perceived similarity" and "personal goal support" actually reflect the correlation between perceived value similarity and personal goal support. Likewise, the correlation of "perceived similarity" and "relationship goal support" actually reflects the correlation between perceived relationship ideal similarity and relationship goal support. Values in brackets signify the standardized 95%-confidence interval of the correlation coefficient obtained through Fisher Z transformation. "Perceived Val. Sim." = perceived value similarity, "Perceived Rel. Ideal Sim." = perceived relationship ideal similarity; "Goal Sim." = Goal Similarity; "Goal Support" = perceived goal support

***p < .001, **p < .01, *p < .05, tp < .1

Figure 18

The complete hypothesised moderated mediation model for value and relationship ideal similarity (N = 450)



Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, tp < .1

the indirect effect was non-significant, β_{abW} = -.02, p = .123, 90% *CI* = [-.06, .01], providing no evidence that the mediation of goal support on the connection of perceived similarity to relationship quality as a whole depends on the goal context.

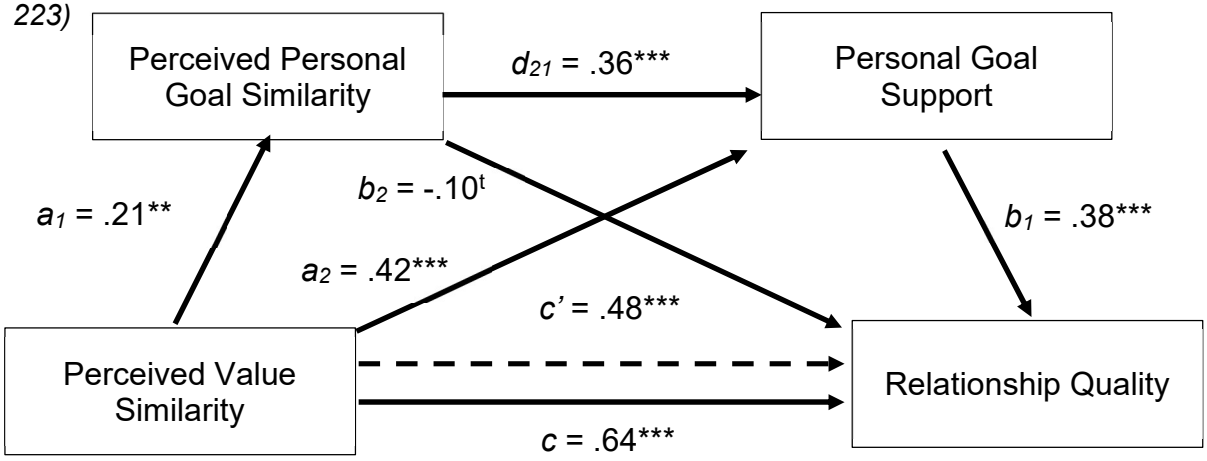
Additional Analyses - Goal Similarity. Our framework suggests that perceived similarity in personal values or relationship ideals signals goal support through signalling common goals. However, such a two-mediator model has not been tested. Thus, we repeated the analysis with Hayes' (2013) model 6, and Figure 19 shows our results for the personal context. In this model, the indirect path is defined in Equation 21:

$$ab_{M_1M_2} = a_1 d_{21} b_2 \quad (21)$$

Where a_1 is the direct effect of perceived similarity on perceived personal goal similarity, d_{21} is the individual effect of goal similarity on goal support while controlling for perceived similarity, and b_2 is the individual effect of goal support on relationship quality, controlling for both perceived similarity and goal similarity. For the personal context, the path from perceived value similarity to relationship quality through perceived goal similarity and perceived goal support was significant, $ab_{M_1M_2}$= .03, p = .001, 95% CI = [.00; .05]. This coexisted with a strong direct mediation through personal goal support, ab_{M_2}= .16, p < .001, 95% CI = [.09; .22]. The indirect effect of perceived value similarity on relationship quality

Figure 19

Two-mediator model of the personality and goal variables in the personal context (N = 223)



Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, $^t p$ < .1

through perceived personal goal similarity was only marginally significant, ab_{M_1}= -.02, p = .083, 95% CI = [-.05; .01]. Thus, perceived value similarity partly relates to relationship quality through our hypothesised pathway, signalling goal support through goal similarity, but it also has a strong independent effect on perceived goal support, bypassing goal similarity.

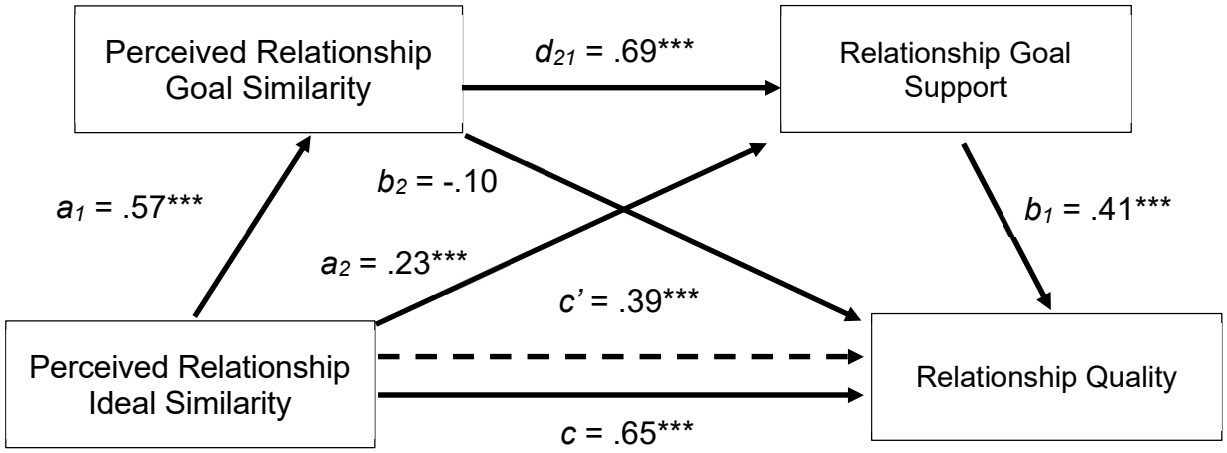
For the relationship context (Figure 20), the indirect path through both mediators was significant $ab_{M_1M_2}$= .14, p < .001, 95%-*CI* = [.04; .23]. As in the personal context, there was no direct mediation through relationship goal similarity after controlling for perceived relationship goal support ab_{M_1}= .03, p = .515, 95%-*CI* = [-.07; .15]; however, there was residual mediation through perceived relationship goal support after controlling for relationship goal similarity , ab_{M_2}= .08, p < .001 95%-*CI* = [.09; .22]. Together, these results indicate that perceived similarity in relationship goals signals goal similarity, and thus goal support, which links to relationship quality.

Lastly, we checked for moderation by goal context in the extended model. The process was the same as described in Equation 18, but we replaced the definition of ab_{W_i} with Equation 22:

$$ab_{W_i} = (a_1 + a_3 W_i)(d_{21} + d_{212} W_i) b_2 \quad (22)$$

Figure 20

Two-mediator model of the personality and goal variables in the relationship context (N = 227)



Note. All values are standardised β coefficients.

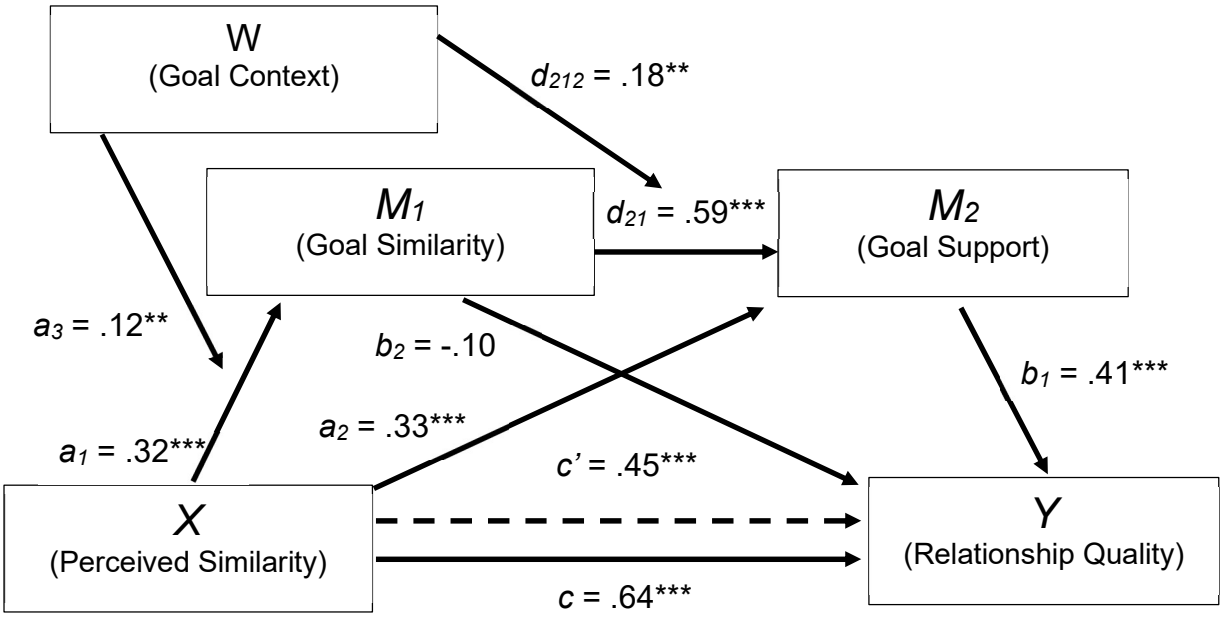
***p < .001, **p < .01, *p < .05, $^t p$ < .1

We found significant moderation on both the a and d paths (Figure 21), showing that perceived relationship ideal similarity relates more strongly to relationship goal similarity, and that relationship goal similarity relates more strongly to relationship goal support compared to the same connections found in the personal context. Finally, our bootstrapping analysis showed significantly moderated mediation, β_{abW} = -.08, p < .001, 90%-*CI* = [-.13, -.03]. The relations between perceived relationship ideal similarity and relationship quality were better explained by goal support through goal similarity than were the relations between perceived values similarity and relationship quality explained by these variables.

Exploratory Analyses - Inverse Pathway Analysis. While these results verify our a-priori predictions about the stronger pathway through goal similarity and goal support for the relationship context than the personal context, the stated mechanism leans on information processing theory (Ajzen, 1974; M. F. Kaplan & Anderson, 1973), which states a bottom-up causal direction. Thus, the relevance of these findings to processes occurring actual relationships can be questioned, as Study 2 has shown stronger top-down than bottom-up causal pathways for both perceived values and ideals. However, a bottom-up effect existed for relationship ideals over the first four months of Study 2, which was of equal strength to top-down effect over the same time period.

Figure 21

Two-mediator moderated mediation model of the personality and goal variables across both contexts (N = 450)



Note. All values are standardised β coefficients.

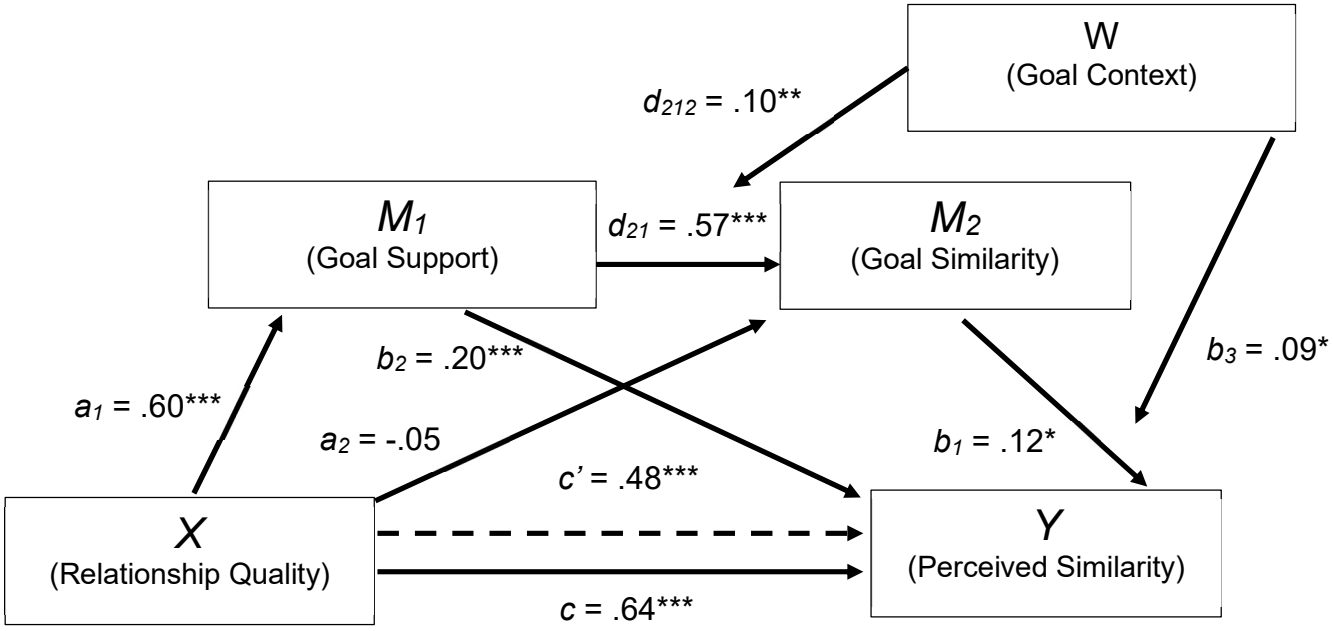
***p < .001, **p < .01, *p < .05, $^t p$ < .1

As stated in the introduction, we believe our model to be compatible with both pathways, as being in a high-quality relationship might lead individuals to perceive perceptions of support or similarity, if those perceptions would be expected of a partner in a prosperous relationship. However, it is unclear if the causal pathway tested above works exactly the same way in reverse, that is, if relationship quality predicts perceived goal support, which predicts perceived goal similarity, which in turn predicts perceived personality similarity. If this were true, it would be at odds with the bottom-up predictions of information processing theory. However, if the connections only follow the hypothesised path bottom-up, we would be more confident in stating that the effect observed in this study represents the process as it works in this specific direction.

To test this possibility, we reran the analysis with an exactly reversed path of relationship quality (X) predicting perceived (Y) similarity through perceived goal support (M_1) and perceived goal similarity (M_2). The results can be seen in Figure 22. All pathways were significant and so was the overall indirect effect of relationship quality to perceived similarity through both mediators $ab_{M_1M_2}$= .04, p = .030 , 95%-*CI* = [.00; .08]. However, the consistently weaker moderation of goal context at both the d and b path made us question whether this was the case for both goal contexts.

Figure 22

Inverse two-mediator moderated mediation model of the perceived personality and goal similarity variables (N = 450)



Note. All values are standardised β coefficients.

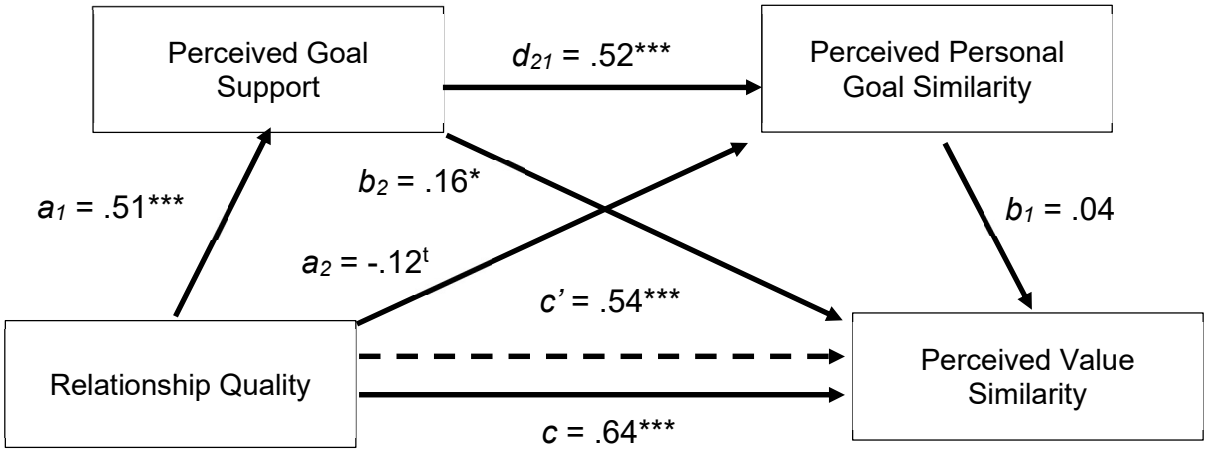
***p < .001, **p < .01, *p < .05, ^{t}p < .1

Indeed, the path through both mediators was not significant in the personal context (Figure 23), $ab_{M_1M_2}$= .01, p = .503 , 95%-*CI* = [-.02; .05]. This lack of association was mostly due to the lack of a connection of relationship quality to perceived value similarity through perceived personal goal similarity, ab_{M_2}= -.00, p = .574 , 95%-*CI* = [-.02; .01], because there was a small indirect effect through perceived goal support ab_{M_1}= .09, p = .028 , 95%-*CI* = [.00; .18]. Thus, it seemed that, while perceived goal support did link to perceived goal similarity, perceived goal similarity did not independently lead to perceived value similarity.

Surprisingly, the path through both mediators was also not significant in the relationship context (Figure 24), $ab_{M_1M_2}$= .06, p = .155 , 95%-*CI* = [-.03; .15], which again was mostly due to the lack of mediation through perceived relationship goal similarity ab_{M_2}= .01, p = .289 , 95%-*CI* = [-.01; .03], while the mediation through perceived goal support was significant ab_{M_1}= .17, p = .005 , 95%-*CI* = [.04; .31]. In sum, these findings suggest that the top-down path runs mostly through the direct effect of relationship quality on perceived similarity, with some indirect effect through perceived goal support, but not perceived goal similarity. Meanwhile, the bottom-up effect follows our hypothesised path, where greater perceived personality similarity signals increased perceived goal similarity,

Figure 23

Inverse two-mediator model of the perceived personality and goal variables in the personal context. (N = 223)

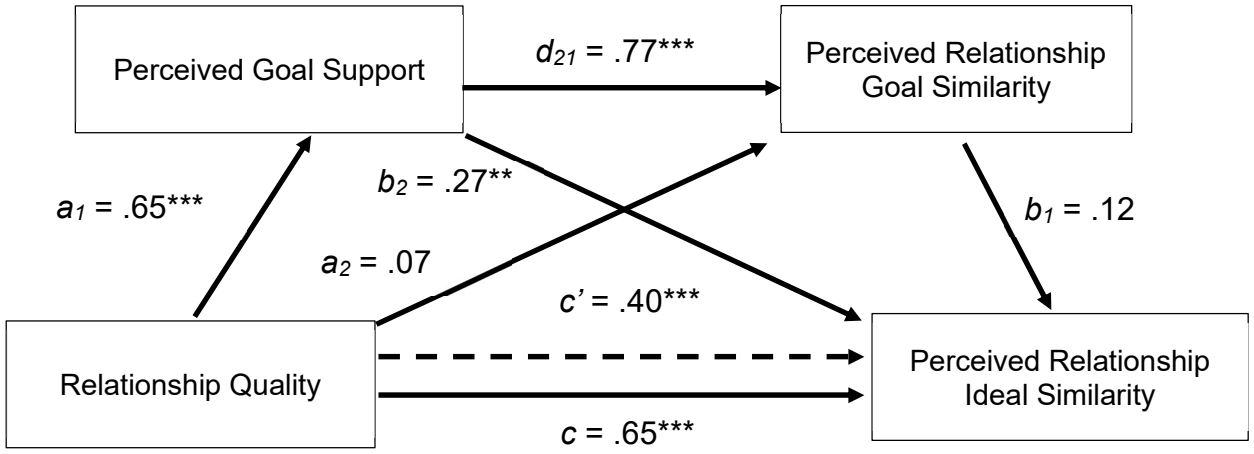


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, $^t p$ < .1

Figure 24

Two-mediator model of the perceived personality and goal variables in the relationship context. (N = 227)



Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, $^t p$ < .1

which facilitates more perceptions of goal support, thus leading to enhanced relationship quality.

General Discussion

Previous research established that perceived similarity between romantic partners is associated with higher relationship quality. However, despite abundant evidence for this association, substantive questions have remained about the psychological and interpersonal mechanisms responsible for this association. Consequently, it has been unknown which dimensions of similarity are more or less strongly associated with relationship quality, the direction of the causal influences, and the psychological mechanism through which perceived similarity is related to relationship quality. To address these questions, we have presented a theoretical framework based on information processing theory (Ajzen, 1974; M. F. Kaplan & Anderson, 1973) and transactive goal dynamics (Fitzsimons et al., 2015). We see the function of perceived similarity as signalling positive information about the other person. Specifically, we postulated and found that perceived similarity in values, relationship ideals, and personality traits, signal information about similar goals. Where such goal similarities would be believed to enhance goal coordination and partner goal support, relationship quality would thus be enhanced. Because values, relationship ideals, and traits relate to goals differently, we believed that this view could help explain why perceived similarity in those dimensions might relate to relationship quality to different degrees. Over the course of one cross-sectional, one longitudinal, and one experimental study, we obtained new insights into the interplay of perceived similarity and relationship quality.

Firstly, we found that perceived similarity is most effective when perceived in values or relationship ideals. Both Study 1 and Study 2 showed a clear hierarchy of effects, with perceived trait similarity consistently showing the weakest connection to relationship quality. The cross-sectional analyses of Study 2 are in line with previous weak or null effects (Amodio & Showers, 2005; Decuyper et al., 2012, 2018; Furler et al., 2014; Middleton, 1993). However, it is unclear whether perceived trait similarity shows weaker effects because it is less strongly associated with the same mediator (goal support) as values and ideals or because it has a (weaker) connection to a different (weaker) mediator. Our results support both explanations. The fact that perceived trait similarity does not explain variance beyond the other dimensions in Study 2 hints at it being connected to relationship quality through the same path as the other dimensions (presumably goal similarity and support), but with a weaker connection. Meanwhile, perceived trait similarity does explain variance above the other dimensions in Study 1, seemingly having its own, separate route to relationship quality.

A potential explanation is that positive information is not about coordination or support of any goal, but about the inclusion of the other in the self (IOS). The IOS measure (Aron et

al., 1992) presents people with a series of self-partner Venn-diagrams, showing different degrees of overlap, with more overlap indicating higher interpersonal closeness. As a measure, the IOS is strongly related to relationship quality (e.g., Frost & Forrester, 2013). Crucially, people with high degrees of IOS also have more difficulty differentiating their own personality traits from their partner's (Aron et al., 1991), which might lead to higher estimations of perceived trait similarity. This reasoning is supported by an indirect partial (i.e., controlled for perceived similarity in the other dimensions) effect of perceived trait similarity, β_{ab} = .06, p < .001, 95% *CI* = [03, .10] and perceived value similarity, β_{ab} = .03, p = .031, 95% *CI* = [.00, .07] on relationship quality through the IOS in Study 1. However, such indirect effects through the IOS was not significant for perceived relationship ideal similarity, β_{ab} = .02, p = .258, 95% *CI* = [-.01, .05]. Due to the lack of a significant individual effect of perceived trait similarity on relationship quality in wave 1 of Study 2, the IOS-mediation effect could not be replicated. Yet when looking at the general effect of perceived similarity, perceived trait similarity was the only effect that was fully mediated by the IOS $\beta_{c'}$= .07, p = .152, 95% *CI* = [-.03, .17], while both other dimensions explained variance through other means as well (values: $\beta_{c'}$ = .18, p < .001, 95% *CI* = [.10, .26]; ideals: $\beta_{c'}$ = .25, p < .001, 95% *CI* = [.17, .33]). The theoretical connection of the IOS to perceived trait similarity combined with these exploratory findings make a case for future research to investigate which perceived similarity dimensions signal inclusion of the other in the self.

Secondly, we discovered that perceived similarity was mostly the consequence, not the cause of relationship quality. In our view, this means that it is more likely for relationship quality to lead to positive illusions about partner goal support, and perceived similarity in goals, ideals, values or traits, likely through lay beliefs about their importance (Morry, 2005). It is conceivable that these perceptions of goal support themselves reinforce and stabilise the perceptions of relationship quality as perceived partner supportiveness is a powerful predictor of relationship quality (Brunstein et al., 1996; Fitzsimons & Fishbach, 2010; Fitzsimons & Shah, 2008; M. Kaplan & Maddux, 2002; Overall et al., 2010).

Our results also support Morry's (2005) statement that the bottom-up effect of perceived similarity might be more important at early stages of the relationship. The only bottom-up effect we found (perceived relationship ideal similarity) predicted relationship quality over the first 4 months, but not the second 4 months. According to Morry (2005), prior positive relationship experiences, attributed to similarity, aid the formation of lay theories about the importance of similarity which drive the influence of relationship quality on perceived similarity. Arguably this top-down effect would be more likely to exists at a later stage of the relationship than an earlier one, during which fewer positive experiences exist. This idea is supported in our data, as across 8 months, relationship quality was a significantly

stronger predictor of perceived relationship ideal similarity, than vice versa, despite the virtually equal strength of cross-lagged effects between the two variables at the start of the study.

Thirdly, we found differences in how perceived similarity dimensions connect to relationship quality. Perceived value similarity directly signalled partner support, without signalling similarity in personal goals, which themselves were related to goal support to a lesser extent. As predicted, perceived relationship ideal similarity related to goal support more strongly through signalling goal similarity. In both goal contexts, goal support was found to predict relationship quality with equal strength. Unexpectedly, the mediation in both contexts was only partial. This finding stands in partial contrast to the findings of Preotu and Turliuc (2013), who were able to show full mediation for the relationship context. One plausible cause relates to a difference between our design and that of Preotu and Turliuc (2013). While we asked our participants to assess their total perceived relationship ideal similarity after completing the relationship ideal questionnaire (Fletcher et al., 1999), Preotu and Turliuc's (2013) participants rated their perceived degree of similarity on every item of Fletcher et al.'s (1999) relationship ideals scale. It might thus be that measures of global similarity might be more susceptible to illusions of similarity caused by relationship quality, than more specific, dimensional investigations.

An explanation for the partial effect might also be found in our Study 2 results. In that study, both dimensions of similarity were more likely to be predicted by relationship quality longitudinally, than to predict it. If we construe the effect of perceived similarity through goal support as the bottom-up portion of the effect (in line with information processing theory), it might be that the large left-over direct effect represents the top-down portion. The stronger mediation in the relationship context would then also explain why perceived relationship ideal similarity was the only dimension to longitudinally predict relationship quality, while perceived value similarity was significantly more likely to be caused by relationship quality over the same time span.

We found support for this suspicion in an exploratory mediational analysis with inverted pathways. The effects of relationship quality on perceived similarity mostly went via a direct route, with a smaller indirect effect through perceived goal support but not perceived goal similarity. The inverse indirect effect through both mediators was even smaller, and only reached significance in the overall model but not the individual groups. Thus, being in a high quality relationship might lead to illusory perceptions of goal support (e.g., Lemay et al., 2007), which in turn might lead to perceptions of similarity in values or ideals, potentially because people ascribe helpful others more positive qualities (Klein & Epley, 2014), and

because being similar in values and ideals is thought to be a positive partner quality in functioning romantic relationships (Morry, 2005; Sprecher & Regan, 2002).

Further, simply observing (or believing) the partner to similarly pursue concrete goals was not sufficient by itself to elicit perceptions of more abstract motivational tendencies (i.e., values or ideals), as the reasons for individual goal pursuits might vary (Kruglanski et al., 2013) and may thus be opaque to the partner. Meanwhile, it is plausible that perceived similarity in broad abstract motivational constructs is more capable of eliciting perceptions of similarity in more concrete goals. To illustrate, it is easy to imagine someone we believe to value achievement studying rigorously for impending exams. However, if we simply observe someone to study for an exam, we might not universally agree that this is due to that person's strong achievement values. We might make all kinds of alternative conclusions about the person's motivation in order to explain the concrete goal of passing the exam (e.g., fear of failing, social conformity, or parental pressure).

Investigating mediation on the bottom-up path from perceived similarity to relationship quality, we also found significant moderation of goal context on the effect of perceived goal similarity on goal support. Goal similarity in relationship goals showed an exceptionally strong connection to relationship goal support (r = .82), while the connection of similarity in personal goals to personal goal support was about half the size (r = .46). Neither perceptions of perceived goal similarity showed a significant connection to relationship quality after goal support was accounted for, showing that perceptions of goal similarity are useful to the extent that they help goal coordination. This process is more important for relationship goals, as most of them can only be pursued and obtained through the combined efforts and will of both partners.

Interestingly, despite the significant moderated mediation in the extended models of Study 3, the overall effects of perceived value similarity and perceived relationship ideal similarity on relationship quality were almost equally strong. This result is inconsistent with the two previous studies, and the bump in the importance of perceived value similarity might be related to the differences in design between the studies. Participants in Studies 1 and 2 rated perceived similarities on three different dimensions, while each participant in Study 3 only rated their partner on one dimension (either values or ideals). If perceptions of similarity are beneficial to the extent that they are illusory (Murray et al., 2002), it is conceivable that the order in which the dimensions are rated has an influence. When rating the first dimension the only influence on it might be relationship quality, but when other dimensions are rated, their similarity might provide a benchmark against which to judge the earlier perceptions, introducing noise on the top-down pathway (creating relationship quality unrelated illusions), but not the bottom-up pathway (as changing the similarity rating should

then cause changes in relationship quality). Thus, dimensions with a stronger top-down connection (perceived value similarity) was more boosted than a dimension with a partial bottom-up connection (perceived relationship ideal similarity).

Our results repeatedly showed that goal context moderated the effect of perceived similarity on goal similarity and support, yet it did not moderate the effect of goal context on goal support at any point. In line with the predictions of TGD theory (and findings by Kaplan & Maddux, 2002), there was no interaction between goal context and the effect of goal support on relationship quality. However, the findings stand in contrast to the predictions made by the eudaimonic theory that the types of goals spouses support each other in influence relationship quality. It should be noted that the eudaimonic theory construes goal-relevant relationship quality as eudaimonic flourishing, which is distinct from positive or negative relationship evaluation such as we have measured (Fowers & Owenz, 2010). Therefore, the obtained effect might be restricted to the evaluative type of relationship satisfaction we have measured. While we also do not find a significant interaction of goal context with goal support when using less hedonically evaluative outcome measure, such as the IOS (see supplementary materials), future studies investigating the relationship between goal support and relationship quality in different goal contexts should be attentive to the outcome measure.

Limitations

The usage of global similarity measures limits the conclusions we can draw regarding the more specific content of the dimensions. This might be important, as higher relationship-relevance of a specific personality trait enhances the association between perceived trait similarity and to relationship quality (Morry et al., 2011). While our study might have found an explanation why “relationship relevance” matters in the first place, it would be interesting to see if more relationship relevant traits or values predict more relationship quality, without relating to goal support. When it comes to values and relationship quality, self-transcendence values (e.g., universalism, benevolence) have been shown to be most important for relationship satisfaction (Litzellachner et al., 2020a; van der Wal et al., 2020). Perceived similarity in those specific values might therefore be more important for relationship functioning. Because this untested notion cannot be investigated with our data, it remains a question to be tackled by future research.

Another notable limitation is the creation of two groups in Study 3 to investigate the effects of relationship and personal goals. Having the same participants rate both personal and relationship variables would have enabled us to investigate the connection between the two contexts. Spill over and compensation effects between personal areas of life and

relationships (such as work; Edwards & Rothbard, 2000) are common. In the relationship context, being perceived as helpful for personal *and* relationship contexts might contribute more to relationship quality than only being instrumental for either goals (Zhang et al., 2007). Future research with a within-subjects measurement of both goal contexts could therefore investigate this question using polynomial regression and response surface analysis (Edwards, 2002). These techniques would allow to test whether the relationship quality is maximized as a function of any combination of the two variables.

Conclusion

People in close romantic relationships qualitatively benefit from perceiving each other a certain way - specifically as similar. Our study presents the first evidence that perceived similarity works through different mechanisms depending on the dimension of similarity. The findings show that it is more important to perceive agreement on goal-related values and relationship ideals than to perceive a partner to possess similar traits. We also found that perceived similarity is more likely a product of relationship quality than its cause. However, at least early in the relationship, perceived similarities in relationship ideals link to relationship quality through signalling relationship goal similarity and relevant partner goal support, as individuals evaluate whether their goals for life and the relationship are compatible. Therefore, we can say that in love, it is not looking at each other, but perceiving to look in the same direction that matters.

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General Discussion

In this programme of research, I investigated the importance of actual and perceived value similarity for romantic relationship quality. To better understand the effects of actual similarity, I used improved statistical techniques to uncover and replicate actual dyadic effects in a new, but important, population of young college relationships. To better understand the effects of perceived similarity, I tested a new framework explaining differences in effects between perceived similarities in values, relationship ideals, and traits. This framework provided a mechanism, accounting for how perceived similarity relates to relationship quality, namely through signalling common goals and thus facilitating perceptions of goal support.

Actual Similarity – Theoretical Advancements Through Dissociating Standpoint and Content

In the studies presented as Academic Paper 1 and Academic Paper 2, I expanded the scope of previous research by looking at previous untested dimensions of values-as-traits and traits-as-values (Hanel & Maio, 2020). This expansion was theoretically important because some theories emphasise the benefits of sharing behavioural dispositions (i.e., traits; Karney & Bradbury, 1995) while other theories emphasise the benefits of sharing and jointly pursuing (abstract) goals (i.e., values; Fitzsimons et al., 2015; Fowers & Owenz, 2010). However, these theories do not explicitly differentiate between the measurement standpoint of these personality dimensions (i.e., behavioural dispositions vs abstract goals), and predictions about specific content (e.g., extraversion, benevolence), and existing scales often measured content from different standpoints (e.g., Konstabel et al., 2017), potentially confounding results (e.g., Leikas et al., 2018). Consequently, it was impossible to know whether effects found in previous research were due to the importance of standpoint, content, or a combination of both.

In Academic Paper 1, I thus recorded values as traits (e.g., trait self-enhancement) and traits as values (e.g., value emotionality), changing the standpoint but conserving the content of SSVS and HEXACO personality measures. The results showed that there were some dimensions where content mattered more than standpoint. There were similar dyadic effects in honesty-humility and self-enhancement regardless of whether related questions were phrased as values or traits. With this motivational content, both the abstract goals and the associated behavioural tendencies were important in a similar way. This consistency across measurement standpoints is interesting, given that past research (e.g., Karney & Bradbury, 1995) has faced a lack of reproducible results concerning the specific dimensions

in which congruence effects were found. The replication of a congruence effect with a different method is one of the strengths of this thesis, as I will argue in the next subsection.

Other motivational content was only important when construed from a specific standpoint. Specifically, I did not find any congruence effects for trait conscientiousness in Academic Paper 1, but a significant true similarity effect for value conscientiousness. That is, agreeing on the importance of being conscientious mattered, while actually being consistently conscientious to a similar extent was not important. Conversely, we found complementarity effects of trait self-transcendence and benevolence in Academic Paper 1 and 2, and complementarity effects of trait conservation in Academic Paper 1, with no evidence for dyadic effects in these dimensions when phrasing them as values. Here, a couple's relationship quality was lower when neither partner reported strong benevolent *traits*, while only the actor's (but not the partner's) benevolence *values* mattered for their own relationship quality. Together, these results show that both standpoint and content matter in the assessment of the role of individual differences in relationship quality.

Based on my research, I recommend that future research on the role of value similarity in romantic relationships (1) test new populations for congruence effects influencing relationship quality, (2) test whether these effects depend on the subjective standpoint used in measurement (i.e., as values, values-as-traits, traits-as-values), and (3) state testable mechanisms for why similarity in these value dimensions should relate to relationship quality and examine these predictions in experimental studies or longitudinal mediational analyses to verify their accuracy. For the first step, research should look for congruence effects in unknown populations or personality content using polynomial regression. To this point, research (Leikas et al., 2018; Weidmann et al., 2017; and the research of this thesis) has investigated values in parents and college relationships, but traits in married couples, parents, and college relationships. However, other populations of interest for research on value similarity might be even newer couples, similar to Tidwell et al.'s (2013) speed-dating sample. With new couples, polynomial regression could be used to contrast how value congruence relates to attraction versus satisfaction. Also, inclusion of newer and older couples simultaneously might enable stronger conclusions about the role of relationship maturation in the mechanisms through which values play a role. After all, the impact of congruence in some values might depend on the stage of the relationship (Shiota & Levenson, 2007). Researchers could test if the shape of value similarity response surfaces is moderated by the exposure to stress over time, or whether congruence effects disappear after accounting for understanding, or felt goal support, indicating that these variables act as mediators in the connection of the congruence effect to relationship quality.

For the second step, future research should measure the same motivational dimensions from different measurement standpoints, as was completed here. My findings showed that for some dimensions, relationship quality relates to the extent to which partner's perform related behaviours, while for other dimensions relationship quality relates to agreement on the abstract standards and goals related to its motivational content. These differences would have been missed by using only the standard instruments. In addition, the use of more precise analytical tools such as polynomial analysis should reduce false positive and false negative findings (J. R. Edwards, 2002) increasing the chance of successful replication. The importance of this approach is made evident by imagining that I had found a significant congruence effect in value (rather than trait) benevolence in Academic Paper 2. In that case, it would have been impossible to tell whether this finding was absent from Leikas et al.'s (2018) study because of differences between their sample and mine (i.e., committed parents vs. college relationships), or differences in their method (i.e., PVQ vs SVS or Single-item relationship quality measure vs. PRQC). Multiple differences between studies make it difficult to locate the reasons for the varying results that have plagued the field of similarity research since its inception and should be avoided.

Thirdly, there is a need for testable explanations for why actual complementarity in certain values link to more vulnerability, adaptability, or more emotional understanding, than other values, and why partners benefit from agreeing on the pursuit of some values (or values-as-traits, traits-as-values), but not others. This issue is elaborated below.

Actual Similarity – Opposites attract or Birds-of-a Feather? The Replicable Importance of Trait Benevolence.

I obtained evidence for both complementarity and similarity effects in Academic Paper 1. Specifically, I found a true similarity effect for value conscientiousness, and a similarity-like effect in value and trait self-enhancement. However, given the sparse evidence for the "opposites attract" narrative (Shiota & Levenson, 2007; Tidwell et al., 2013; Zhou et al., 2017), the most interesting effects obtained were the complementarity patterns in self-transcendence and conservation values-as-traits. In fact, the pattern for self-transcendence turned out to be the first replicable complementarity effect using polynomial regression in the new sample of Academic Paper 2. This effect is of special interest for several reasons.

First, the complementarity effect would not have been detectable in this form using analytical methods other than polynomial regression. I showed in both Academic Paper 1 and Academic Paper 2 how the limited additive pattern found on the response surface would look deceivingly similar to the dissimilarity effect found in benevolence-related self-characteristics by Tidwell et al. (2013), had I chosen to operationalise similarity in

benevolence as an absolute difference score. Importantly, while these results lend credibility to Tidwell et al.'s (2013) finding (which the researchers interpreted as a chance finding), my analysis extends previous knowledge by clarifying that it is not an effect of dissimilarity. Rather, the positive effect of being different in trait benevolence is limited to individuals who are low in benevolence themselves.

Second, the benevolence complementarity effect showed only when benevolence values were measured as traits and not when they were measured as values. While both benevolence values and traits showed actor effects, partner effects (as indicated by the interaction) only mattered when benevolence values were measured as traits. Behaving in a benevolent way, rather than believing in the importance of being benevolent had more impact on the partners' levels of relationship quality. This makes sense, considering the roles that interdependence (Rusbult & Van Lange, 2003) and communal orientation (Clark & Mills, 1979) play in relationship quality. After all, both of these relationship variables favour the performance of prosocial acts for intrinsic reasons, rather than mentioning the importance of ideal levels of prosocial conduct per se.

The role of communal orientation might be worth exploring further. To explain the benevolence complementarity effect theoretically, I linked its existence to research on communal orientation (Clark & Mills, 1979) and strength (Mills et al., 2004). It is conceivable that highly benevolent individuals also benefit from a benevolent partner if their relationship orientation focuses on reciprocal exchange rather than a non-reciprocal communal relationship. Communal relationships are defined by the presence of a norm of mutual responsiveness, where giving benefits to the partner is done out of an intrinsic motivation to enhance the partner's welfare (Clark & Mills, 1979). The strength of this motivation is described by the later-coined term communal strength (Mills et al., 2004). This intrinsic desire to care for a partner is also reflected in benevolence values such as *mature love* or *true friendship*, resulting in a strong link between the importance self-transcendence values and communal strength (van der Wal et al., 2020). Consequently, caring for others without the need for compensation is part of the self-concept of individuals high in communal strength (i.e., potentially high in self-transcendence/benevolence). For these people with a self-concept based on a communal orientation, having a partner who is also highly motivated to act prosaically (i.e., high in self-transcendence/benevolence) can jeopardise their self-verification process (Kogan et al., 2010), as voluntary prosocial acts suddenly get reciprocated. Early research on communal orientation has identified that receiving reciprocal acts in exchange for past favours can even lead to the communally-oriented "receiver" liking the "giver" less, than if there had been no favours given in return (Clark & Mills, 1979). Ultimately, I believe this process to have led to the pattern where partner benevolence being

positively associated with relationship quality, unless the actor was high in benevolence themselves.

Because the trait benevolence complementarity effect was replicated, future research should also discover whether the effect also replicates with the same methods in a different sample, or with different methods (e.g., Tidwell et al.'s (2013) self-characteristics or a specially designed relationship-benevolence scale) in a similar sample (i.e., young student couples). In addition, research could extend the results to experimental paradigms, for example, by experimentally creating diagnostic situations in which participants can either benefit themselves or their partner. If both partners participate at the same time, couples with two low-benevolence partners should be less positively impacted by this exercise than couples with one partner higher in benevolence, while the couples with only one partner high in benevolence should be indistinguishable from couples where both are high in benevolence.

Perceived Similarity – Accuracy of the Proposed Framework and the Bottom-Up Path

In Academic Paper 3, I presented an explanation for an observed and replicated difference between the effect of goal-informative dimensions such as perceived value similarity and relationship ideal similarity, and the less goal-informative dimensions of perceived trait similarity when predicting relationship quality. Overall, the data supports the predictions derived from the framework, as the goal-informative dimensions have a stronger connection (cross-sectionally and longitudinally) with relationship quality, and the perceived similarity-relationship quality connection is significantly mediated by perceived similarity and goal support. Lastly, the hypothesised pathway is strongest for perceived relationship ideal similarity. In Academic Paper 3, I was able to show that this pattern was not just due to the conceptual similarity between relationship ideals and relationship quality, but due to stronger connections with perceived relationship goal similarity and perceived goal support. This finding showed that the information derived from similarity between partners is related to relationship quality to the extent that the information is conducive to perceiving goal support (which is more likely to be the case for similarity in relationship goals than for similarity in personal goals).

Beyond showing the viability of the hypothesised causal path, Academic Paper 3 also disentangled bottom-up and top-down explanations for the perceived similarity-relationship quality connection. In line with Morry's (2005) similarity-attraction hypothesis, the longitudinal evidence presented in Academic Paper 3 indicated that bottom-up effects were more likely early in the relationship. However, as the relationships progressed, only cross-lagged top-down effects remained significant.

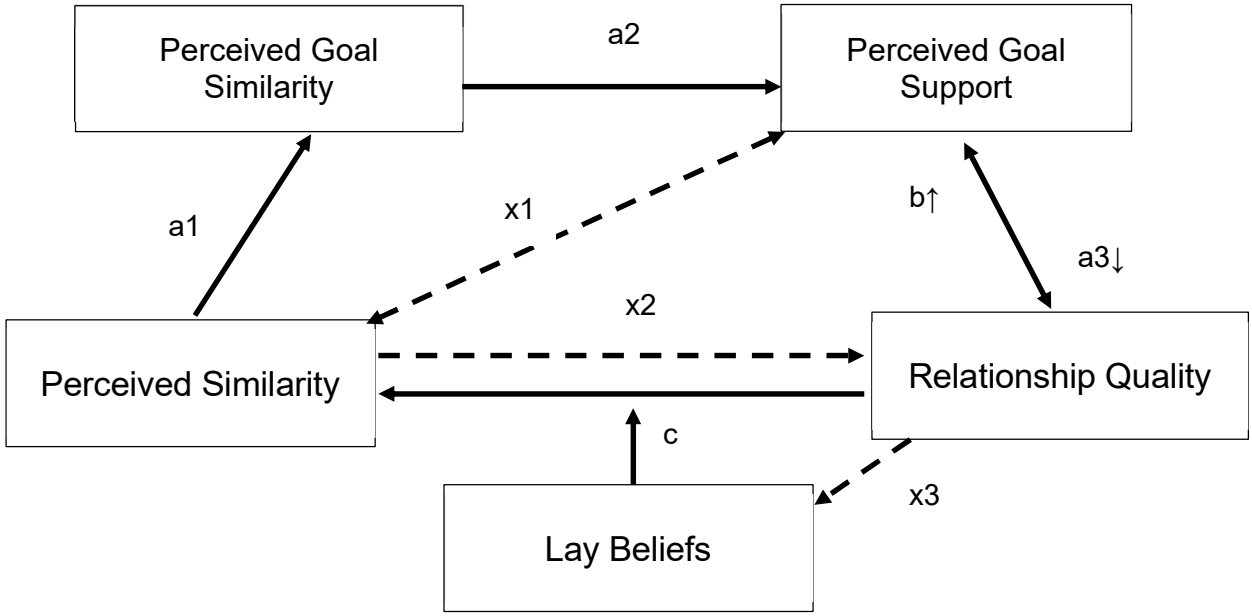
Of interest, Morry's (2005) theory states these top-down effects as direct links between relationship quality and perceived similarity, only moderated by the strength of lay beliefs about the importance of the psychological dimensions of similarity for relationship functioning. While I thought it theoretically possible that top-down effects partly go through perceived goal support and goal similarity as well, an exploratory inverse-path mediation analysis showed that perceived personal or relationship goal similarity did not have a direct effect on perceived similarity in abstract values or relationship ideals, insinuating that the top-down effects were more likely to come directly from relationship quality (as Morry would have predicted), or through enhanced perceptions of goal support (potentially similarly to relationship quality–perceived partner support links observed by Lemay et al., 2007), which then lead to perceiving more similar abstract goals (i.e., values and ideals), but not more similar concrete goals.

However, this pattern also shows that the causal pathway hypothesised in my framework is most likely to describe a bottom-up process, which might be most relevant during early formation stages of relationships. The evidence for the existence of this process emphasises the importance of agreeing on abstract relationship ideals and concrete relationship goals with a partner. Beyond this description of the functioning of the bottom-up effect, the top-down effect might be a natural extension of the model (Figure 25). In fact, the bottom-up effect might lead to increased relationship quality which might then lead to (1) the creation of lay-beliefs about the importance of similarity in that dimension, and then to (2) the increase in perceived similarity. Thus, the bottom-up effect of perceived similarity has the potential to begin a cycle in which more perceived similarity leads to more relationship quality, which in turn leads to more perceived similarity.

However, Figure 25 also shows several unknown connections in the mechanism mediating between perceived similarity and relationship quality. However, it should be kept in mind that most of these causal connections need testing in a longitudinal way before causality can be established. First, it can only be speculated about why perceived similarity should be directly related to goal support, either bottom-up or top-down (Figure 25, path x1). It is plausible that perceiving a partner to have similar values, ideals, or traits directly leads to a greater willingness to support that partner. Early research on the similarity-attraction hypothesis (e.g., Byrne et al., 1971) theorised that discovering similarity with others is a rewarding experience itself, potentially making individuals more motivated to help that partner in their goal pursuits, regardless of whether the pursuit is aligned with their own goals or not. This willingness may then lead to perception of partner support, because perceived partner support is mostly a projection of the individuals' willingness to support the partner (Canevello & Crocker, 2010; Lemay et al., 2007). Because the same connection would

Figure 25

Integrative perceived similarity model of bottom-up and top-down pathways



Note. Letters reference theoretical explanations or empirical evidence for the functioning of the respective connections. Connections marked with an "x" have either no theoretical explanations or no empirical evidence.

a = My framework and Academic Paper 3 of this thesis, *b* = Lemay et al.'s (2007) work on perceived partner responsiveness; *c* = Morry's (2005) similarity-attraction hypothesis; *x* = unknown.

involve some complex additional steps to work as a top-down process ("why would perceiving partner support lead to perceptions of similarity in abstract features of personality?"), I propose that this indirect connection is more likely play a role the bottom-up pathway than in the top-down pathway.

If this were the explanation for this potential connection, however, we would also see a strong (full) mediation of the effect of perceived similarity on perceived partner support by relationship quality (see Figure 25, path x2 and path b). However, this full mediation was not found in an exploratory analysis of the data of Academic Paper 3, Study 3, where perceived similarity was related to goal support beyond the effect of relationship quality (β = .30, p < .001). Because the effect of perceived similarity on perceived goal support was halved (zero-order *r* = .55) by including relationship quality, questions arise about the nature of the direct connection of perceived similarity and perceived goal support (beyond the effect of positive partner and relationship evaluation) and the direct effect of perceived similarity on relationship quality (beyond the effects of goal similarity and goal support). The latter connection is especially interesting, because the present research only provides evidence for

a large leftover connection between perceived similarity and relationship quality but cannot address whether this connection represents a bottom-up, top-down, or mixed influence.

Lastly, the similarity-attraction hypothesis stipulates a mechanism for how an increase in relationship quality might cause an increase in perceived similarity, to the extent to which perceived similarity is believed to be important for relationship functioning (Morry, 2005). However, while this mechanism is empirically supported, the creation of lay beliefs regarding the importance of similarity through relationship quality has not been empirically tested. Contemporary similarity-attraction research (Collisson & Howell, 2014; Morry, 2005; Morry et al., 2011) has varied perceived importance by comparing perceived similarity in different dimensions of personality (similar to Academic Paper 3). Future tests of the roles of perceived value or relationship ideal similarity would benefit from longitudinal observations of changes in the believed importance of similarity in these dimensions, and how these lay beliefs affect the influence of relationship quality on perceived similarity in the dimensions.

In sum, the research on perceived similarity presented in this thesis has made an important contribution to understanding how perceived similarity can lead to relationship quality by signalling common goals, and thus partner goal support. My longitudinal research has provided evidence in favour of the similarity-attraction hypothesis in a natural (non-experimental) setting and showed a way in which bottom-up and top-down connections of perceived similarity and relationship quality can coexist, or even reciprocally influence each other. However, I have also shown that my framework appropriately describes the bottom-up pathway, by demonstrating how the overall indirect effect does not become significant in a top-down direction after inverting the connections in the mediation model. Therefore, my research filled gaps in the knowledge of the functioning of the bottom-up portion of the perceived similarity-relationship quality, which may be most relevant at early stages of relationships.

Perceived Similarity – Conclusions for the Ideal Standards Model

Out of all dimensions of perceived similarity, only perceived relationship ideal similarity was consistency positively associated with relationship quality. This consistency of association has appeared both within measurement time points and across time. Perceived relationship ideal similarity was also the only significant predictor of future relationship quality out of all dimensions of perceived similarity. My framework holds that relationship ideals owe their causal force to their strongly goal-informative character, and the superordinate goal status of the goals they are informative about. Evidence for this notion of my framework was at least partly provided by the partial mediation of the effect of perceived relationship ideal similarity on relationship quality by both perceived concrete relationship goal similarity, and

perceived goal support. However, this thesis has not yet discussed the implications of these findings for the theory that developed the concept of relationship ideals, the Ideal Standards Model (Fletcher et al., 1999, 2000a).

According to the Ideal Standards Model, relationship ideals have two main functions: they act as standards for comparisons and motivate regulatory efforts. First, individuals compare their current view of the relationship with their abstract ideals. Higher consistency between actual and ideal should produce higher relationship quality. Conversely, when actual-ideal consistency is perceived to be low, the individual's important relationship goals have not been met. While this mechanism linking relationship ideals to important relationship goals was postulated by the Ideal Standards Model (Fletcher et al., 1999), Study 3 of Academic Paper 3 provides the first empirical evidence for a link between relationship ideals and concrete relationship goals (albeit in their perceived similarity). This finding constitutes an important contribution, as it illuminates the source of the motivational energy behind perceived relationship ideal discrepancy.

Beyond this empirical contribution, construing relationship ideals as superordinate goals also leads to the conclusion that perceived relationship ideal similarity is an outcome of this comparison between actual and ideal relationship goals. If relationship ideals link to relationship goals, and relationship goals are superordinate goals by nature, the Ideal Standards Model implies a perception of similarity in relationship ideals as the necessary outcome of the comparative step. Consequently, an individual who perceives an actual-ideal mismatch in relationship goals will also likely infer a self-partner mismatch in ideals. In the framework I present, a perceived mismatch in relationship ideals is then problematic (and sought to be reduced), as perceiving ideal mismatch poses a direct threat to the attainment of important relationship goals due to potential partner non-compliance.

Upon perceiving such a discrepancy, the Ideal Standards Model postulates that individuals will be motivated to bring their perceptions in line with their ideals, or vice versa. To reduce the discrepancy, individuals might attempt to alter their relationship (by leaving or attempting to alter their partner's behaviour) or their own cognitions (by altering their perception or ideals). Using the logic from the paragraph above, an interesting prediction can be derived: Couples should become increasingly more similar in their perceptions of each other's relationship ideals over time when their relationship goals are similar. In fact, observing long established couples who do not perceive each other's relationship ideals as similar might be diagnostic of particular relationship characteristics and circumstances. Partners who perceive each other as espousing different relationship ideals might be unable to exit the relationship due to external commitments, while being unwilling to change, see the partner in a different light, or alter their own perceptions of the ideal relationship. Such

issues could be revealed through use of overall questions of perceived relationship ideal dissimilarity as a quick diagnostic tool, and I hope future research will examine this possibility.

In sum, the Ideal Standards Model construes relationship ideals as criteria by which individuals measure their partner's behaviour and their relationships. My research has provided empirical evidence for a strong link between perceived similarity in relationship ideals and perceived similarity in relationship goals. Because perceived relationship goals can only be achieved and enjoyed in common with the partner, similarity in the perception of their importance is a logical prerequisite. Consequently, perceiving a partner to have dissimilar ideals is a threat to relationship goal attainment. However, upon discovery of such dissimilarities, partners would be motivated to reduce the discrepancy. In cases where the discrepancy persists, the relationship ideal dissimilarity might be a good diagnostic metric for revealing that atypical relationship maintenance mechanisms are at work.

Perceived Similarity – Conclusions for Relations to Actual Similarity

Throughout the studies presented in this thesis, I have conceptualised actual similarity as distinct from perceived similarity. This conceptualisation has rested on the assumptions that both constructs are independent predictors of relationship quality. I assumed both to influence relationship quality through different mechanisms, with actual similarity working through coordinating behaviour, while perceived similarity signals potential for goal support. However, working through different mechanisms does not mean that they are necessarily independent. For example, perceptions of similarity might be rooted in observed partner behaviour that is interpreted as evidence for similarity. It is therefore worth considering whether the present evidence fits this emphasis on their conceptual distinctiveness.

In fact, previous research has shown that perceptions of similarity in values or traits are egocentric illusions, not accurate perceptions (Murray et al., 2002), and some of the findings in this thesis reinforce the separability of actual and perceived similarity. In both samples where both actual and perceived similarity effects were assessed, both types of similarity were independent predictors of relationship quality. Supplementary analyses of the sample presented in Academic Paper 1 show that all interactions for conscientiousness traits-as-values (β_4 = .21, p < .001), conservation values-as-traits (β_4 = -.36, p < .001), and self-transcendence values-as-traits (β_4 = -.18, p = .004), remain significant after entering perceived value similarity (for conscientiousness: β = .35, p < .001) and perceived trait similarity (for conservation: β = .23, p < .001; for self-transcendence: β = .24, p < .001). Similar analyses for the data presented in Academic Paper 2 show that the interaction for

benevolence values-as-traits (β_4 = -.23, p = .002) was also (marginally) independent of perceived trait similarity (β = .09, p = .053).

While this evidence supports my conceptualisation of different mechanisms, there are two main limitations to this conclusion. First, while actual similarity was derived from both partners' self-reports about specific values or traits, perceived similarity was an overall estimation of partner similarity in a broad dimension. Past research has shown that more general estimates of similarity might be better predictors of relationship quality than more specific trait-level estimates (Tidwell et al., 2013). This fits with both Murray et al.'s (2002) discovery about the importance of egocentric illusions of similarity, and the discovery made in my longitudinal study in Academic Paper 2 that perceived (value and trait) similarity is more likely to the outcome of relationship quality than its predictor. If relevant perceptions of similarity are motivated inferences or illusions based on relationship quality, then this effect would be expected to be stronger for more abstract estimations of similarity. Abstract estimates give the participant a more room to "find" evidence for similarity, if they are motivated to do so (i.e., through their lay beliefs about the importance of similarity for high-quality relationships; Morry, 2005). In contrast, the room for illusory egocentric assimilation might be smaller in more concrete questions. It would be interesting for future research to examine the moderating effect of the level of abstraction in a perceived similarity estimate on its relations with relationship quality.

Second, broad similarity questions might motivate participants to compare themselves to their partners in terms of goals or behaviours that do not appear on any finite list of values or traits. Thus, even if people were completely accurate in their partner perception, the overall estimate of perceived value or trait similarity would only be fully explained by their actual similarity on a comprehensive list of all thinkable values and traits. However, neither Schwartz's (1992) Model, nor the HEXACO model (Ashton et al., 2004) represent an exhaustive list (Hanel & Maio, 2020). Therefore, unless we assume that the measured values or traits are the only comparison that matters for making the corresponding overall similarity judgement (or at least the ones that matter most), we can expect the perceived similarity judgement contain a lot of variance that is unrelated to actual similarity on any individual value or trait. Thus, the independence of their effects might not be due to their different mechanisms of affecting relationship quality, but merely an artefact of two different styles of measurement.

For a more effective comparison, perceived similarity would need to be measured at the same level as actual similarity. It would then be possible to test the full polynomial model for both actual and perceived similarity in a joint regression analysis for each specific dimension (e.g., self-transcendent values, neuroticism) or for the aggregate constructs (e.g.,

mean values, mean traits). The result of this procedure would be two response surfaces – one for actual and one for perceived similarity – which show the mutually independent relations of actual and perceived similarity on relationship quality. This method would be cumbersome statistically (as adding more predictors requires more tests and more power to help in the face of controlling for Type 1 error), but is also highly demanding of participants, as they are essentially required of answering every question twice (or four times in the case of this thesis, where participants answered every value and trait question rephrased in the other standpoint). Despite this drawback, simultaneously evaluating the effects of actual and perceived similarity remains another interesting avenue for future research.

Limitations and Future Directions

One important limitation to my research on actual value similarity is that it does not consider circumstances that might influence which combination of values between partners is beneficial. It is plausible that couples with certain combinations of values are more suited to thrive in certain environments. For instance, it is unclear whether the effects I found reflect general advantages of value congruence, or whether they are specific to the environment of college age couples. Researching the context of similarity effects would also be important from a theoretical standpoint, as it would allow tests of the extent to which actor and partner value similarity can buffer extraneous stress. For example, the COVID-19 crisis has altered the daily lives of many individuals, and people differ in their adherence to infection prevention behaviours. These individual differences in preventive behaviours have also been linked to the big-five personality traits (Blagov, 2020) and one interesting aspect of these links is that extraversion is negatively correlated with observing social distancing measures. It is thus plausible that a mismatch in the extent to which extraversion is both exhibited and valued (i.e., a highly extraverted actor with an introverted partner) might now pose a disadvantage for a cohabiting couple. This is especially interesting because research conducted before the COVID-19 outbreak found no effect of partner extraversion on relationship quality (Leikas et al., 2018; Weidmann, Schönbrodt, et al., 2017; and the Academic Papers presented in this thesis).

Likewise, the research on perceived similarity I presented in this thesis can be further advanced by an experimental study manipulating perceived similarity. However, to date, there has not been a single study that involved the manipulation of perceived (value) similarity in ongoing relationships. Presumably, this is the case because the most common technique to manipulating perceived similarity is the bogus stranger paradigm (e.g., Byrne et al., 1971). While this method works fine with fictional strangers (see Böhm et al., 2010 for a recent application), in the case of actual relationships, giving false feedback about a partner's actual values poses ethical challenges. However, one ethically sound possibility would be to

experimentally highlight differences or similarities, while giving factually correct feedback. For example, Hanel et al. (2019) showed participants data about the actual (non-fictitious) value differences between UK and Polish citizens, with the differences depicted as a series of bar charts, or by superimposing the mean importance ratings of both countries on a radar chart. Their results showed that UK high-school students estimated the similarity between UK and Polish citizens higher when the similarity was depicted with the superimposed distribution than when depicted using bar charts. Using the same presentational technique, researchers could alter the way of depicting actor and partner values, giving deception-free feedback that simply makes the similarities, differences, or both salient.

Conclusion

In this thesis, I have examined the question of whether "birds-of-a-feather flock together" by investigating the effects of actual and perceived similarity in romantic partners' values on the quality of their relationships. This issue was examined using an expanded conceptual/measurement approach, robust cross-sectional, longitudinal, and experimental methods, and more precise analytical approaches (polynomial regression and response surface analysis) than in most past research. Across three studies, I was able to demonstrate that the answer to the similarity-question depends on the dimension of personality similarity. Similarity in values of being organised and systematic (i.e., being conscientious) related to higher relationship quality, while having a partner who acts in a benevolent way benefits relationships most when the other partner is low in benevolence. This replicable effect also helped explaining a puzzling finding obtained by previous researchers (Tidwell et al., 2013). Overall, this pattern showed that relationships do not benefit from merely being similar in values in general. Couples thrive when they are congruent in regard to specific values or in their behavioural expressions of the values.

Beyond actual similarity, my research also provided an explanation for the effect of perceived similarity in values, relationship ideals, and traits on relationship satisfaction. In line with my hypothesised framework, I found that perceived similarity in personal dispositions predicts relationship quality to the extent that it is informative about shared goals. Further, seeing a partner pursue similar goals was only beneficial for relationship quality if it led to perceiving enhanced partner support in the mutual striving. Accordingly, I showed how perceived similarity in dimensions that are more informative about goals (i.e., values and relationship ideals) are more closely linked to relationship quality, than perceived similarity in dimensions that are less informative about goals (i.e., traits). Also, dimensions informative about relationship goals (i.e., relationship ideals) show a stronger connection to relationship quality than dimensions informative about personal goals (i.e., values), because

relationship goals always require some degree of cooperation from both partners, thus requiring to be shared to some extent.

Lastly, the findings of my longitudinal investigation support the idea that perceived similarity might cause relationship quality at early stages of a relationship, but that relationship quality influences perceptions of similarity at later stages (Morry, 2005). Therefore, while actually being similar is only sometimes beneficial, and sometimes even detrimental for a relationship, perceiving the partner to be similar is more consistently associated with relationship benefits. These benefits arise especially when the perceptions of similarity convey information about common goals that are relevant for goal coordination and have the potential to enhance the efficiency of the partner's individual goal pursuits through making mutual support plausible.

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Appendix I – Supplementary Materials to Academic Paper 1

Table I-A

Coefficients and RSA components for actual similarities in traits phrased as traits and as values when predicting relationship quality with all control variables and an interaction with gender

	HEXACO						HEXACO-V					
	H	E	X	A	C	O	H	E	X	A	C	O
Regression Coefficients												
β_1	-.02	.18	.14	.08	.03	.03	.08	.02	.04	.01	.10	-.02
β_2	.17*	.09	-.02	.21*	.12	-.07	.06	.26**	-.03	.20*	.05	-.03
β_3	-.17*	.01	.05	-.07	-.03	-.01	-.12*	-.06	-.08	-.06	.02	-.03
β_4	.02	-.07	-.12	-.14	.08	.13	-.11	-.07	-.00	-.00	.23***	.06
β_5	-.23*	.03	-.04	-.01	.04	-.06	-.11	-.08	-.07	-.21*	-.15	-.08
Three-way interaction with gender	.06	.06	.08	-.03	-.02	-.04	.09	-.06	-.10	.06	.03	-.02
RSA components												
a_1	.15	.28	.12	.29*	.15	-.04	.06	.28*	.01	.20	.15	-.01
a_2	**-.38****	-.03	-.11	-.23	.09	.05	-.43**	-.22	-.15	-.27*	.10	-.05
a_3	-.17	.09	.16	-.13	-.09	.10	-.23	-.24	.06	-.19	.05	.05
a_4	-.42	.11	.13	.06	-.06	-.20	-.17	-.08	-.15	-.27	**-.36***	-.16

Note. β_1 = actor traits, β_2 = partner traits, β_3 = actor traits^2, β_4 = actor traits x partner traits, β_5 = partner traits^2, N = 348.
H = honesty-humility (inverse), E = emotionality, X = extraversion, A = agreeableness, C = conscientiousness, O = openness. Significant RSA components backed up by their relevant regression coefficients are written in bold. The R^2-values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. HEXACO-V = Traits-as-values.
*p < .05, **p < .01, ***p < .001

Table I-B

Coefficients and RSA components for actual similarities in values phrased as traits and as values when predicting relationship quality with all control variables and an interaction with gender

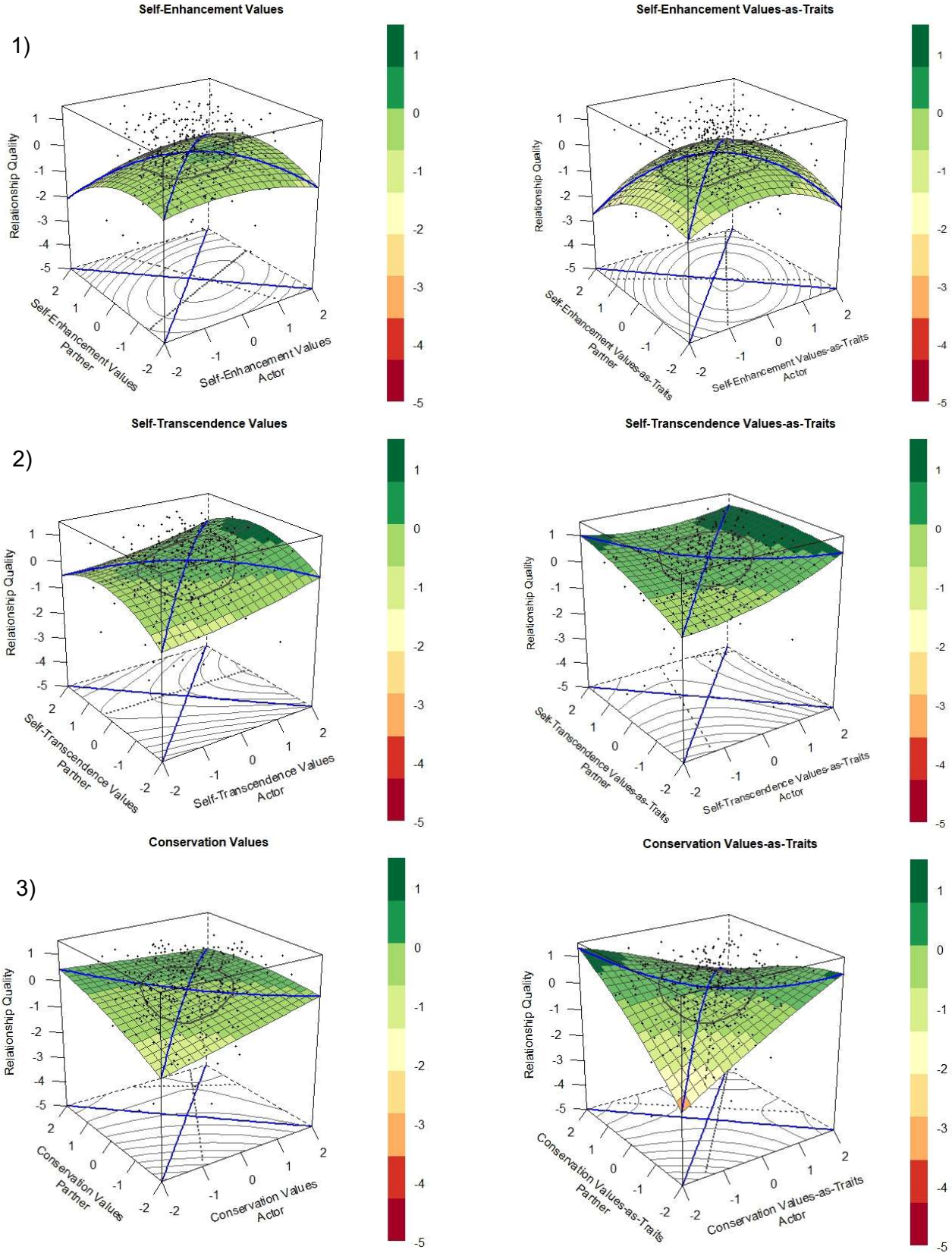
	SSVS				SSVS-T			
	Self-Enhancement	Openness to Change	Self-Transcendence	Conservation	Self-Enhancement	Openness to Change	Self-Transcendence	Conservation
Regression Coefficients								
β_1	.11	.17*	.26**	.12	.13	.25***	.19*	.13
β_2	-.17*	.06	.12	.22**	-.11	.03	.21*	.23**
β_3	-.10	.08	-.13	.00	-.24**	.17*	.08	-.03
β_4	.10	-.04	-.01	-.11	.13	.04	-.09	-.34***
β_5	-.19*	.04	-.20	-.05	-.20*	-.01	-.05	-.07
Three-way interaction with gender	.04	.02	.05	.05	.05	-.07	-.04	-.05
RSA components								
a_1	-.06	.23*	.37**	.34*	.03	.28*	**.40****	.37*
a_2	-.19	.07	-.17	-.15	**-.30****	.20	-.05	**-.45****
a_3	.28*	.11	.14	-.11	.25	.22	-.02	-.10
a_4	**-.40***	.15	-.15	.06	**-.57****	.12	.12	.24

Note. β_1 = actor traits, β_2 = partner traits, β_3 = actor traits2, β_4 = actor traits x partner traits, β_5 = partner traits2. N = 348. Significant RSA components backed up by their relevant regression coefficients are written in bold. The R^2-values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. SSVS-T = Values-as-traits.

*p < .05, **p < .01, ***p < .001

Figure I-A

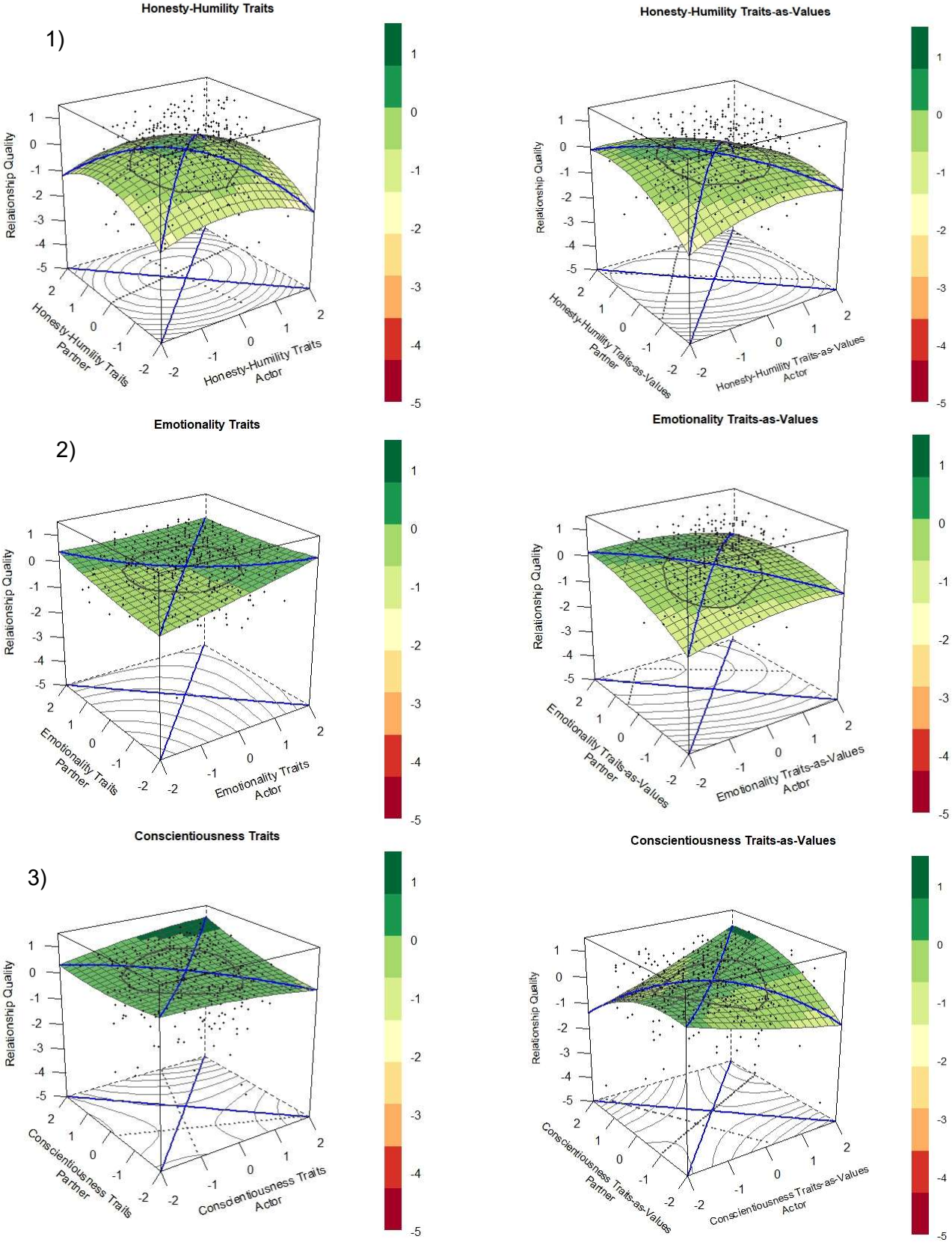
Response surface plots depicting actor's relationship quality as a function of actor and partner self-enhancement, self-transcendence, and conservation with all control variables



Note. The left column depicts each content dimension when coded as values, whereas the right column depicts them when coded as traits. Dotted lines on the floor of each graph represent the principal axes, blue lines on the floor represent the LOC and LOIC.

Figure I-B

Response surface plots depicting actor's relationship quality as a function of actor and partner honesty-humility, emotionality, and conscientiousness with all control variables



Note. The left column depicts each content dimension when coded as traits, whereas the right column depicts them when coded as values. Dotted lines on the floor of each graph represent the principal axes, blue lines on the floor represent the LOC and LOIC.

Table I-C

Coefficients and RSA components for actual similarities in traits phrased as traits and as values when predicting single item relationship happiness

	HEXACO						HEXACO-V					
	H	E	X	A	C	O	H	E	X	A	C	O
Regression Coefficients												
β_1	.10	-.06	.07	.03	.04	-.02	.09	-.03	.05	.02	.03	.04
β_2	.07	.01	.03	.16**	.12	-.03	.06	.10	-.02	.14*	.05	-.00
β_3	-.10	.07	.04	.05	.00	-.00	-.08	-.08	-.10	.01	-.02	.01
β_4	.01	.10	-.01	-.04	-.00	.08	.02	-.05	-.01	.01	.21***	.02
β_5	-.10	-.04	-.02	-.01	.02	-.03	-.10	-.05	-.03	.01	-.03	-.04
RSA components												
a_1	.17	.07	.10	.19	.16	-.05	.15	.07	.03	.16	.07	-.03
a_2	-.19	-.19	-.08	.00	.02	.04	-.16	-.19	-.15	.03	.16	-.01
a_3	.04	.13	.04	-.13	-.08	.01	.04	-.12	.07	-.12	.01	.04
a_4	-.22	.08	-.06	.09	.02	-.11	-.19	-.08	-.12	.00	-.26	-.05

Note. β_1 = actor traits, β_2 = partner traits, β_3 = actor traits^2, β_4 = actor traits x partner traits, β_5 = partner traits^2, N = 348.
H = honesty-humility (inverse), E = emotionality, X = extraversion, A = agreeableness, C = conscientiousness, O = openness.
Significant RSA components backed up by their relevant regression coefficients are written in bold. The R^2-values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model.
HEXACO-V = Traits-as-values

*p < .05, **p < .01, ***p < .001

Table I-D

Coefficients and RSA components for actual similarities in values phrased as traits and as values when predicting single-item relationship happiness.

	SSVS				SSVS-T			
	Self-Enhancement	Openness to Change	Self-Transcendence	Conservation	Self-Enhancement	Openness to Change	Self-Transcendence	Conservation
Regression Coefficients								
β_1	-.07	.03	.05	-.00	-.01	.14*	.09	.06
β_2	-.02	.05	.13*	.11	-.05	.02	.12	.13*
β_3	-.09	.01	-.16	.06	-.15**	-.01	-.12	-.00
β_4	.13*	-.02	.12	.06	.08	.04	.10	-.13
β_5	-.03	.02	-.03	.08	-.05	-.03	-.03	-.10
RSA components								
a_1	.09	.08	.17	.10	-.07	.16	.21	.19
a_2	-.01	.01	-.08	.12	-.13	.01	-.04	.02
a_3	-.06	-.02	.08	-.12	.04	.12	-.02	-.06
a_4	-.28	.05	-.31	.09	-.28	-.08	.12	.24

Note. β_1 = actor traits, β_2 = partner traits, β_3 = actor traits2, β_4 = actor traits x partner traits, β_5 = partner traits2. N = 348. Significant RSA components backed up by their relevant regression coefficients are written in bold. The R^2-values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. SSVS-T = Values-as-traits.

*p < .05, **p < .01, ***p < .001

Appendix II – Supplementary Materials to Academic Paper 2

Table II-A

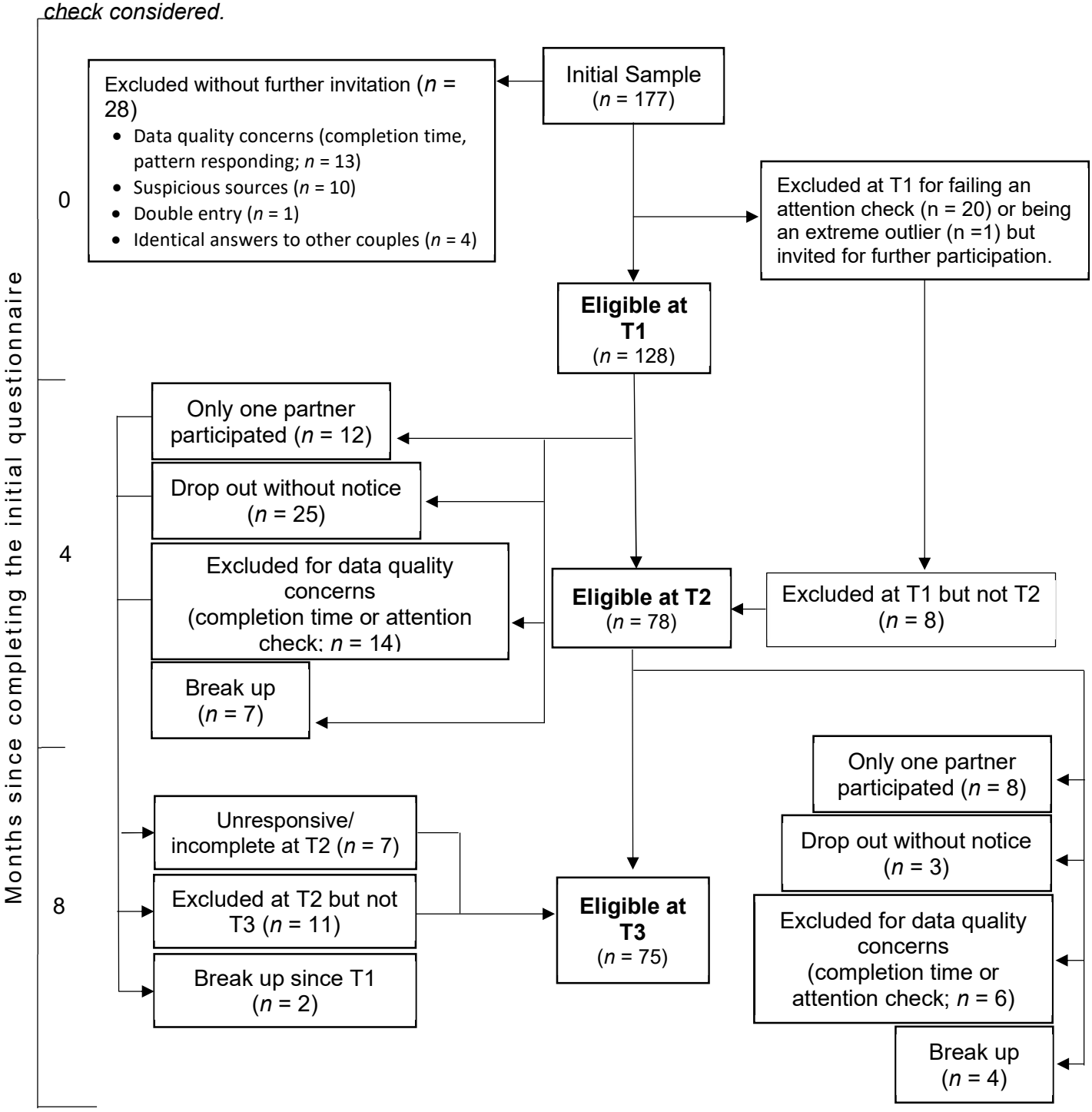
Zero-order Pearson correlation of values, values-as-traits, and relationship quality across waves.

			SVS																						
			T1								T2								T3						
			U	B	C	T	S	SE	CO	RQ	U	B	C	T	S	SE	CO	RQ	U	B	C	T	S	SE	CO	RQ
SVS-T	T1	UN	**.63**	**.37**	.06	.18	.11	.57	.15	.14	**.49**	**.25**	.07	.08	.03	**.41**	.07	.05	**.49**	**.27**	.01	.09	.03	**.43**	.06	.12
		BE	**.29**	**.63**	**.38**	**.42**	**.29**	**.51**	**.43**	**.22**	**.25**	**.48**	**.28**	**.31**	**.29**	**.39**	**.33**	.06	**.30**	**.51**	**.25**	**.32**	**.35**	**.44**	**.35**	.18
		CO	.12	**.37**	**.72**	**.49**	**.44**	**.27**	**.62**	.12	.02	**.29**	**.56**	**.44**	**.49**	.16	**.55**	.08	.06	**.28**	**.52**	**.41**	**.46**	.18	**.52**	.11
		TR	.12	**.36**	**.54**	**.77**	**.42**	**.26**	**.69**	-.02	.09	**.31**	**.52**	**.65**	**.43**	.21	**.60**	-.05	.16	**.35**	**.55**	**.68**	**.49**	**.28**	**.65**	.02
		SE	.11	**.36**	**.53**	**.48**	**.58**	**.26**	**.62**	.11	.06	**.29**	**.47**	**.42**	**.53**	.18	**.52**	.04	.13	**.34**	**.44**	**.46**	**.55**	**.26**	**.55**	.07
		SET	**.54**	**.55**	**.23**	**.33**	**.22**	**.61**	**.31**	**.20**	**.44**	**.40**	.19	.21	.17	**.46**	.21	.06	**.45**	**.43**	.14	.22	.20	**.49**	.21	.16
		CON	.14	**.43**	**.69**	**.69**	**.58**	**.31**	**.76**	.08	.07	**.35**	**.60**	**.60**	**.57**	.22	**.66**	.02	.15	**.39**	**.58**	**.61**	**.59**	**.29**	**.67**	.07
		RQ	.19	**.20**	.14	.04	.18	**.22**	.14	**.56**	**.27**	.16	.04	.00	.11	**.24**	.06	**.71**	.18	.20	.03	-.04	.16	.21	.06	**.61**
	T2	UN	**.60**	**.41**	.08	.21	.14	**.58**	.18	.17	**.72**	**.53**	.21	**.32**	.21	.69	**.28**	.14	**.64**	**.49**	.15	**.27**	.15	**.64**	.22	.19
		BE	**.35**	**.59**	**.30**	**.36**	**.27**	**.52**	**.37**	.20	**.52**	**.75**	**.36**	**.46**	**.39**	**.69**	**.45**	.17	**.38**	**.60**	**.28**	**.33**	**.35**	**.54**	**.37**	**.29**
		CO	.04	**.33**	**.61**	**.44**	**.37**	.20	**.54**	.13	.10	**.35**	**.67**	**.55**	**.55**	**.23**	**.65**	.16	.13	**.32**	**.59**	**.48**	**.47**	**.25**	**.57**	.20
		TR	.02	**.33**	**.49**	**.67**	**.38**	.19	**.61**	-.02	.15	**.41**	**.64**	**.81**	**.53**	**.30**	**.74**	.03	.16	**.35**	**.52**	**.68**	**.47**	**.28**	**.64**	.02
		SE	.03	**.32**	**.44**	**.42**	**.43**	.19	**.50**	.11	**.21**	**.43**	**.48**	**.53**	**.66**	**.34**	**.63**	.15	.17	**.37**	**.40**	**.44**	**.55**	**.29**	**.53**	.16
		SET	**.54**	**.54**	.20	**.31**	.22	**.61**	**.29**	.20	**.69**	**.69**	**.31**	**.43**	**.32**	**.76**	**.40**	.17	**.57**	**.59**	.23	**.33**	**.26**	**.65**	**.32**	**.26**
		CON	.03	**.39**	**.59**	**.61**	**.47**	**.23**	**.65**	.08	.19	**.47**	**.69**	**.75**	**.68**	**.35**	**.79**	.13	.18	**.41**	**.58**	**.64**	**.59**	**.32**	**.68**	.14
		RQ	.12	.12	.12	.04	.13	.14	.11	**.71**	.20	.14	.11	.04	.14	.19	.11	**.52**	.12	.11	.10	-.03	.19	.13	.15	**.75**
	T3	UN	**.57**	**.32**	.14	.22	.16	**.51**	.21	.13	**.57**	**.37**	.16	.20	.20	**.52**	.21	.16	**.71**	**.47**	**.24**	**.30**	**.24**	**.67**	**.29**	.21
		BE	**.33**	**.58**	**.47**	**.42**	**.36**	**.50**	**.48**	**.26**	**.42**	**.61**	**.36**	**.39**	**.45**	**.56**	**.45**	.22	**.47**	**.79**	**.46**	**.50**	**.57**	**.69**	**.58**	**.33**
		CO	.08	**.33**	**.69**	**.46**	**.47**	.22	**.61**	.12	.06	**.33**	**.62**	**.49**	**.57**	.20	**.62**	.15	.19	**.44**	**.68**	**.53**	**.62**	**.34**	**.68**	.21
		TR	.07	**.37**	**.56**	**.68**	**.36**	.23	**.63**	-.10	.10	**.36**	**.57**	**.69**	**.47**	**.24**	**.65**	-.03	.22	**.44**	**.68**	**.82**	**.55**	**.36**	**.78**	.03
		SE	.00	**.27**	**.53**	**.45**	**.50**	.14	**.57**	.13	.08	**.30**	**.45**	**.43**	**.58**	.20	**.54**	.20	.17	**.44**	**.61**	**.52**	**.74**	**.33**	**.70**	**.24**
		SET	**.51**	**.49**	**.33**	**.35**	**.28**	**.57**	**.38**	.21	**.56**	**.55**	**.29**	**.33**	**.36**	**.61**	**.37**	.21	**.67**	**.69**	**.39**	**.44**	**.44**	**.76**	**.48**	**.30**
		CON	.05	**.37**	**.67**	**.62**	**.51**	.22	**.70**	.05	.10	**.38**	**.62**	**.62**	**.62**	.25	**.69**	.12	.22	**.51**	**.75**	**.73**	**.74**	**.39**	**.84**	.18
		RQ	.18	.23	.16	.09	.17	.23	.16	**.61**	**.26**	**.26**	.14	.09	.20	**.29**	.16	**.75**	.17	.21	.14	.02	.21	.22	.13	**.47**

Note. Correlation coefficients in bold are significant at $p < .001$. Columns represent value scores, while rows represent values-as-traits. T1 – T3 signify the different measurement points after zero, four, and eight months respectively. Coefficients on the diagonal of relationship quality within waves represent the intraclass correlation coefficient. U = universalism, B = benevolence, C = conformity, T = tradition, S = security, SE = self-transcendence, CO = conservation, RQ = relationship quality.

Figure II-A

Flowchart of the couples in the sample throughout the data collection period, attention check considered.



Note. Participants were excluded for completion time issues, if they took less than 10 minutes to complete the questionnaire. Pattern responding, Identical answering, and double entries were identified through visual inspection of answers, participant codes, and e-mail addresses. In the case of a double entry, only the later entry was excluded. The participants deemed suspicious sources completed the questionnaire in rapid succession, their e-mail addresses all followed the same schema of *firstname].[lastname][numbers]@gmail.com*. The names depicted in the e-mails also never matched the participant codes.

Table II-B

Multilevel polynomial regression fixed effects and response surface analysis results for T1 with attention check considered and all control variables. (n = 128 couples)

	SVS							SVS-T						
	UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON
β_1	.16*	.15*	.16*	.08	.13*	.15*	.13*	.16*	**.21*** **	.16*	.06	.14*	.18**	.14*
β_2	.09	.01	-.01	-.08	.01	.04	-.06	.09	.11	.05	-.08	-.05	.08	-.05
β_3	.08	-.03	.07	-.05	.01	.02	.02	.10*	-.04	.09	.00	.00	.03	.01
β_4	-.02	-.08	.08	-.08	-.02	-.03	.01	-.03	**-.25****	-.06	-.02	-.10	-.13	-.10
β_5	.06	-.04	.06	-.03	.06	-.00	.04	.07	.07	.10	-.02	.01	.08	.04
a_1	.26*	.16	.15	-.00	.14	.20	.07	.21*	.32**	.21	-.02	.09	.25*	.06
a_2	.12	-.16	.21	-.16	.05	-.01	.07	.06	-.21*	.12	-.08	-.09	-.03	-.02
a_3	.06	.14	.17	.16*	.11	.11	.19*	.12*	.10	.10	.14	.19*	.10	.16*
a_4	.15	.01	.04	-.02	.08	.06	.05	.09	.28*	.24	.04	.11	.23	.08
R^2	.10*	.09*	.11**	.09*	.09*	.09*	.08*	.11**	**.18*****	.11**	.07	.10*	**.13*****	.03

Note. Coefficients in bold are significant at the corrected alpha level of $p < .005$. The R^2 values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. All effects were obtained while controlling for relationship duration. β_1 = actor effect, β_2 = partner effect, β_3 = quadratic actor effect, β_4 = actor x partner interaction, β_5 = quadratic partner effect, a_1 = linear effect on LOC, a_2 = quadratic effect on LOC, a_3 = linear effect on LOIC, a_4 = quadratic effect on LOIC. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, RQ = relationship quality.

Control variables: Age, Gender, Couple Gender composition, Relationship orientation, Parenthood, Relationship orientation, Cohabitation status

*$p < .05$, **$p < .01$, ***$p < .001$

Table II-C

Multilevel polynomial regression fixed effects and response surface analysis results for T2 with attention check considered and all control variables. (n = 78 couples)

	SVS							SVS-T						
	UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON
β_1	**.34*** **	**.27** **	.16	07	.24**	**.32*** **	.18	**.29*** **	**.**24** **	.17	.03	.19*	**.30*** **	.12
β_2	.01	-.01	.00	-.10	.02	.03	-.04	.02	.03	-.01	-.05	.08	.02	.00
β_3	.09	.02	.10	.00	.17*	.05	.11	.12*	.04	.10	-.02	.01	.08	.01
β_4	.00	-.02	-.11	.01	-.17	.01	-.16	-.09	.03	.08	-.01	-.15	-.04	-.02
β_5	-.08	.01	.09	.00	.06	-.08	.06	.02	.07	.07	.06	.03	.02	.06
a_1	.36*	.25*	.16	-.03	.26	.35*	.13	.31*	.27*	.16	-.02	.27	.32*	.12
a_2	.00	.01	.07	-.01	.09	-.01	.01	.06	.15	.25	.04	-.10	.06	.05
a_3	.33**	.28**	.16	.18	.21	.28**	.22	.27*	.20*	.19*	.08	.10	.28*	.12
a_4	.01	.04	.30	.02	.42	-.04	.33	.23	.09	.09	.05	.19	.13	.10
R^2	**.19** **	.13	.10	.07	.14	.17**	.10	.14*	.14*	.11	.07	.11	.14*	.08

Note. Coefficients in bold are significant at the corrected alpha level of $p < .005$. The R^2 values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. All effects were obtained while controlling for relationship duration. β_1 = actor effect, β_2 = partner effect, β_3 = quadratic actor effect, β_4 = actor x partner interaction, β_5 = quadratic partner effect, a_1 = linear effect on LOC, a_2 = quadratic effect on LOC, a_3 = linear effect on LOIC, a_4 = quadratic effect on LOIC. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, RQ = relationship quality.

Control variables: Age, Gender, Couple Gender composition, Relationship orientation, Parenthood, Relationship orientation, Cohabitation status, having read the relationship article sent one month before wave 2.

*$p < .05$, **$p < .01$, ***$p < .001$

Table II-D

Multilevel polynomial regression fixed effects and response surface analysis results for T3 with attention check considered and all control variables. (n = 75 couples)

	SVS							SVS-T						
	UN	BE	CO	TR	SE	SET	CON	UN	BE	CO	TR	SE	SET	CON
β_1	.23*	**.30*** **	.18	.11	**.35*** **	**.31****	.24*	.29**	**.38*** **	**.30****	.05	**.27****	**.32*** **	.21*
β_2	.07	-.07	-.13	-.25*	-.09	-.01	-.22*	.06	.05	-.06	**-.31****	-.05	.07	-.21*
β_3	.04	.04	.10	.04	.19*	-.01	.15	**.13****	.08	.15*	.06	.09	.03	.10*
β_4	-.11	-.03	.05	-.07	-.10	-.11	-.06	-.04	.04	.04	.14	.01	-.07	-.03
β_5	.14	.06	.02	-.03	.09	.05	.01	.05	.10	.03	-.06	.05	.06	-.00
a_1	.31	.22	.04	-.14	.26	.29	.02	.35*	.44*	.24	-.27	.22	.39*	.01
a_2	.21	.07	.17	-.06	.18	-.03	.09	.13	.22	.22*	.14	.14	.02	.13
a_3	.17	.37**	.31*	.36*	.44**	.32**	**.46****	.23	.33*	.36**	.36*	.32*	.26*	.42**
a_4	-.16	.14	.08	.09	.38	.18	.22	.22	.14	.03	-.14	.13	.16	.03
R^2	.09	.11	.07	.07	.13	.12	.09	.11	.19**	.13	.10	.10	.16*	.07

Note. Coefficients in bold are significant at the corrected alpha level of $p < .005$. The R^2 values were computed using L. J. Edwards et al.'s (2008) method for calculating the variance explained by all fixed effects in a multilevel model. All effects were obtained while controlling for relationship duration. β_1 = actor effect, β_2 = partner effect, β_3 = quadratic actor effect, β_4 = actor x partner interaction, β_5 = quadratic partner effect, a_1 = linear effect on LOC, a_2 = quadratic effect on LOC, a_3 = linear effect on LOIC, a_4 = quadratic effect on LOIC. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, RQ = relationship quality.

Control variables: Age, Gender, Couple Gender composition, Relationship orientation, Parenthood, Relationship orientation, Cohabitation status, having read the relationship article sent one month before wave 2 and before wave 3.

*$p < .05$, **$p < .01$, ***$p < .001$

Table II-E

Cross-lagged model results for all values and traits in relation to relationship satisfaction with attention checks considered

		T1-T2 (N = 176)				T2-T3 (N = 151)				T1-T3 (N = 171)			
		$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*
SVS	UN	-.01	.841	.14	.114	.11	.054	-.04	.493	.02	.750	.06	.302
	BE	-.01	.857	.02	.732	.13	.020*	-.04	.570	.11	.087	.07	.222
	CO	.06	.254	-.06	.341	.06	.242	.01	.846	.09	.158	-.05	.393
	TR	-.02	.743	-.08	.166	.05	.411	-.08	.154	.03	.605	-.04	.394
	SE	.01	.877	-.03	.656	.07	.225	.07	.216	.05	.529	.05	.409
	SET	-.01	.826	.06	.316	.13	.020*	.04	.477	.07	.293	.07	.275
	CON	.02	.786	-.07	.151	.07	.228	-.00	.943	.06	.354	-.03	.513
SVS-T	UN	-.02	.352	.03	.568	.05	.346	.05	.481	.06	.380	.02	.704
	BE	-.04	.406	-.00	.986	.14	.011*	.10	.127	.11	.088	.05	.351
	CO	.06	.266	.07	.273	.11	.050*	.02	.782	.11	.083	.04	.425
	TR	-.00	.945	-.00	.973	-.02	.770	-.03	.544	.05	.383	-.07	.135
	SE	-.04	.513	.01	.868	.08	.144	.10	.155	.00	.999	.01	.888
	SET	-.04	.508	.01	.908	.10	.064	.08	.208	.09	.151	.05	.452
	CON	.00	.986	.01	.905	.06	.252	.02	.733	.06	.360	-.03	.455

Note. Cross-lagged model outcomes for all values. The sample for each comparison comprised individuals (not couples) with complete data in relevant variables in both waves, who also passed attention and data quality checks. The $\beta_{\uparrow}$ column shows coefficients for earlier values or traits predicting later relationship quality, while the $\beta_{\downarrow}$ column shows coefficients for earlier relationship quality predicting later values or traits. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, RQ = relationship quality.

*p < .05, **p < .01, ***p < .001

Table II-F

Stability and bootstrapping results for the causal direction of all values and traits predicting relationship quality in all possible wave comparisons with attention checks considered.

		T1-T2 (*N* = 176)				T2-T3 (*N* = 151)				T1-T3 (*N* = 171)			
		$r_{1\text{-}2}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-.	*p*	$r_{2\text{-}3}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-	*p*	$r_{1\text{-}3}$	$\beta_{\uparrow\downarrow}$+	$\beta_{\uparrow\downarrow}$-.	*p*
SVS	UN	.66	720	4280	.288	.71	4940	60	.024*	.66	1752	3248	.701
	BE	.67	1467	3353	.587	.68	4812	188	.075	.70	3076	1924	.770
	CO	.68	4668	332	.133	.74	3303	1697	.679	.72	4808	192	.077
	TR	.70	3067	1933	.773	.74	4764	236	.094	.76	3765	1235	.494
	SE	.67	2887	2133	.885	.72	3172	1828	.731	.65	2311	2689	.462
	SET	.69	1138	3862	.455	.71	4925	75	.030*	.68	2345	2655	.938
	CON	.75	3920	1080	.432	.78	4265	735	.294	.78	4449	551	.220
SVS-T	UN	.67	537	4463	.215	.65	3833	1167	.756	.62	3248	1752	.718
	BE	.60	2649	2351	.940	.61	3427	1573	.462	.70	3822	1178	.471
	CO	.63	1951	3049	.378	.70	4468	532	.213	.72	4346	654	.262
	TR	.73	2757	2243	.897	.73	2139	2861	.856	.77	4486	514	.206
	SE	.67	907	4093	.363	.60	2309	2691	.924	.62	2647	2353	.941
	SET	.65	1253	3747	.114	.63	3675	1325	.530	.66	3561	1439	.288
	CON	.76	1952	3048	.781	.75	3629	1371	.548	.80	4740	260	.104

Note. All comparisons were run with 5000 iterations. The sample for each comparison comprised individuals (not couples) with complete data in relevant variables in both waves, who also passed attention and data quality checks. The $\beta_{\uparrow\downarrow}$+ column shows the number of iterations were the personality coefficient in predicting changes in relationship quality was higher than the relationship quality coefficient predicting changes in personality. The$\beta_{\uparrow\downarrow}$-coefficient shows the number of iterations where the opposite was true. All p-values were two-sided. UN = universalism, BE = benevolence, CO = conformity, TR = tradition, SE = security, SET = self-transcendence, CON = conservation, RQ = relationship quality.

*p < .05, **p < .01, ***p < .001

Appendix III – Supplementary Materials to Academic Paper 3

Table III-A

Study 1 hierarchical regression model comparisons of perceived similarity dimensions predicting relationship happiness (N = 535)

		β		
		Values	**Ideals**	**Traits**
Zero model		.25*** [.17;.33]	.34*** [.26;.42]	.26*** [.18;.34]
Two Predictor Models				
	+ Values	-	.29*** [.20;.38]	.20*** [.11;.29]
	+Ideals	.10* [.00;.19]	-	.17*** [.08;.25]
	+ Traits	.15** [.06;.25]	.28*** [.21;.37]	-
Full model		.04 [-.06;.13]	.26*** [.17;.35]	.16*** [.07;.24]

Note. R^2 values are calculated using L. J. Edwards et al.'s (2008) method for estimating the variance explained by all fixed factors in a multilevel model. The significance estimations in the R^2 columns relate to the β-coefficient of the predictor (zero model), the R^2 change to the zero model (for all the two-predictor models), or the R^2 change to the two-predictor model without the predictor (last step). Values in brackets represent the 95% confidence interval. Ideals = relationship ideals.

Table III-B

Study 1 hierarchical regression model comparisons of perceived similarity dimensions predicting IOS (N = 535)

		β		
		Values	**Ideals**	**Traits**
Zero model		.33***	.26***	.39***
		[.23;43]	[.16;.36]	[.29;.49]
Two Predictor Models				
	+ Values	-	.12	.30***
			[-.00;.24]	[.19;.42]
	+ Ideals	.27***	-	.34***
		[.15;.39]		[.23;.45]
	+ Traits	.19**	.13*	-
		[.07;.30]	[.03;.24]	
Full model		.15*	.07	.29***
		[.03;.28]	[-.05;.19]	[.18;.41]

Note. R^2 values are calculated using L. J. Edwards et al.'s (2008) method for estimating the variance explained by all fixed factors in a multilevel model. The significance estimations in the R^2 columns relate to the β-coefficient of the predictor (zero model), the R^2 change to the zero model (for all the two-predictor models), or the R^2 change to the two-predictor model without the predictor (last step). Values in brackets represent the 95% confidence interval. Ideals = relationship ideals.

Table III-C

Study 2 hierarchical regression β coefficient change when inserting different dimensions of perceived similarity predicting single item relationship happiness

	T1 (*N* = 436)			T2 (*N* = 208)			T3 (*N* = 189)		
	Values	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**
Single-Predictor Model	.29** [.20; .38]	.41*** [.33; .50]	.29*** [.20; .38]	.32*** [.19; .44]	.43*** [.31; .55]	.27*** [.13; .40]	.41*** [.28; .55]	.52*** [.40; .64]	.30*** [.16; .44]
Two-Predictor Models									
+ Values	-	.36*** [.22; .50]	.19*** [.09; .29]	-	.36*** [.22; .50]	.14 [-.01; .29]	-	.42*** [.27; .57]	.10 [-.07; .26]
+ Ideals	.07 [-.04; .17]	-	.16** [.06; .25]	.12 [-.02; .27]	-	.11 [-.02; .25]	.17* [02; .32]	-	.08 [-.06; .22]
+Traits	.20*** [.10; .30]	.38*** [.25; .51]	-	.25** [.10; .40]	.46*** [.34; .57]	-	.36*** [.19; .52]	.48*** [.34; .62]	-
Full Model	.01 [-.10; .12]	.34*** [.23; .45]	.15** [.05; .25]	.09 [-.07; .25]	.35*** [.20; .49]	.08 [-.07; .23]	.16^{t} [-.01; .33]	.41*** [.26; .57]	.02 [-.13; .17]

Note. Rows indicate the predictor related to β coefficients in different models indicated by rows. Ideals = relationship ideals. Values in brackets represent the 95% confidence interval.

$^{t}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$

Table III-D

Study 2 hierarchical regression β coefficient change when inserting different dimensions of perceived similarity predicting IOS

	T1 (*N* = 436)			T2 (*N* = 208)			T3 (*N* = 189)		
	Values	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**
Single-Predictor Model	.17*** [.08; .26]	.24*** [.16; .33]	.23*** [.14; .32]	.23** [.10; .36]	.21** [.08; .34]	.20** [.06; .34]	.21** [.07; .36]	.18*** [.03; .32]	.20** [.05; .34]
Two-Predictor Models									
+ Values	-	.21*** [.11; .32]	.19*** [.09; .29]	-	.13 [-.02; .28]	.10 [-.06; .26]	-	.11 [-.05; .27]	.11 [-.06; .29]
+ Ideals	.05 [-.06; .16]	-	.16*** [.07; .26]	.15^{t} [-.00; .32]	-	.13^{t} [-.02; .28]	.16^{t} [-.01; .34]	-	.15^{t} [-.01; .31]
+ Traits	.09^{t} [-.01; .19]	.18*** [.09; .28]	-	.18* [.02; .33]	.16* [.02; .31]	-	.15 [-.03; .33]	.08 [-.09; .26]	-
Full Model	-.01 [-.13; .10]	.19*** [.08; .30]	.17** [.07; .27]	.13 [-.05; .30]	.12 [-.04; .27]	.08 [-.08; .25]	.12 [-.08; .31]	.07 [-.11; .24]	.10 [-.08; .28]

Note. Rows indicate the predictor related to β coefficients in different models indicated by rows. Ideals = relationship ideals. Values in brackets represent the 95% confidence interval.

$^{t}p < .1$, *$p < .05$, **$p < .01$, ***$p < .001$

Table III-E

Study 2 hierarchical regression β coefficient change when inserting different dimensions of perceived similarity predicting PRQ (PNRS+)

	T1 (*N* = 436)			T2 (*N* = 208)			T3 (*N* = 189)		
	Values	**Ideals**	**Traits**	**Traits**	**Values**	**Ideals**	**Values**	**Ideals**	**Traits**
Single-Predictor Model	-	-	-	-	-	-	.34*** [.21; .48]	.52*** [.40; .64]	.27*** [.13; .41]
Two-Predictor Models									
+ Values	-	-	-	-	-	-	-	.47*** [.32; .62]	.12 [-.05; .28]
+ Ideals	-	-	-	-	-	-	.09 [-.06; .24]	-	.06 [-.08; .20]
+ Traits	-	-	-	-	-	-	.28** [.11; .45]	.49*** [.36; .63]	-
Full Model	-	-	-	-	-	-	.07 [-.09; .24]	.46*** [.31; .61]	.03 [-.13; .18]

Note. Rows indicate the predictor related to β coefficients in different models indicated by rows. Ideals = relationship ideals. Values in brackets represent the 95% confidence interval.

$^{t}p < .1$, $*p < .05$, $**p < .01$, $***p < .001$

Table III-F

Study 2 hierarchical regression β coefficient change when inserting different dimensions of perceived similarity predicting NRQ (PNRS-)

	T1 (*N* = 436)			T2 (*N* = 208)			T3 (*N* = 189)		
	Values	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**	**Values**	**Ideals**	**Traits**
Single-Predictor Model	-	-	-	-	-	-	-.40*** [-.54; -.27]	-.44*** [-.57; -.31]	-.33*** [-.47; -.19]
Two-Predictor Models									
+ Values	-	-	-	-	-	-	-	-.31*** [-.47; -.15]	-.13 [-.30; .03]
+ Ideals	-	-	-	-	-	-	-.23** [-.39; -.07]	-	-.17* [-.32; -.02]
+ Traits	-	-	-	-	-	-	-.32*** [-.49; -.16]	-.37*** [-.51; -.22]	-
Full Model	-	-	-	-	-	-	.-.18^{t} [-.36; .00]	-.30*** [-.46; -.14]	-.10 [-.26; .07]

Note. Rows indicate the predictor related to β coefficients in different models indicated by rows. Ideals = relationship ideals. Values in brackets represent the 95% confidence interval.

$^{t}p < .1$, *$p < .05$, **$p < .01$, ***$p < .001$

Table III-G

Cross-lagged model results for all perceived similarity dimension in their relations to Single Item Relationship Happiness

	T1-T2 (*N* = 209)				T2-T3 (*N* = 189)				T1-T3 (*N* = 175)			
	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*
Values	.06 [-.07; .18]	.370	.12 [-.00; .25]	.059^{t}	.10 [-.03; .23]	.151	.17 [.03; .31]	.023*	.16 [.03; .29]	.016*	.08 [-.05; .22]	.229
Ideals	.23 [.11; .36]	< .001***	.17 [.04; .29]	.013*	.18 [.04; .31]	.011*	.28 [.13; .43]	< .001***	.14 [.02; .27]	.031*	.22 [.08; .36]	.003**
Traits	.01 [-.11; .14]	.849	.06 [-.06; .17]	.322	.12 [-.00; .25]	.063^{t}	.12 [-.01; .25]	.086^{t}	.05 [-.08; .18]	.441	.06 [-.06; .19]	.328

Note. The $\beta_{\uparrow}$ column shows coefficients for earlier perceived similarity predicting changes in relationship quality, while the $\beta_{\downarrow}$ column shows coefficients for earlier relationship quality predicting changes in perceived similarity. Values in brackets represent the 95% confidence interval.

Table III-H

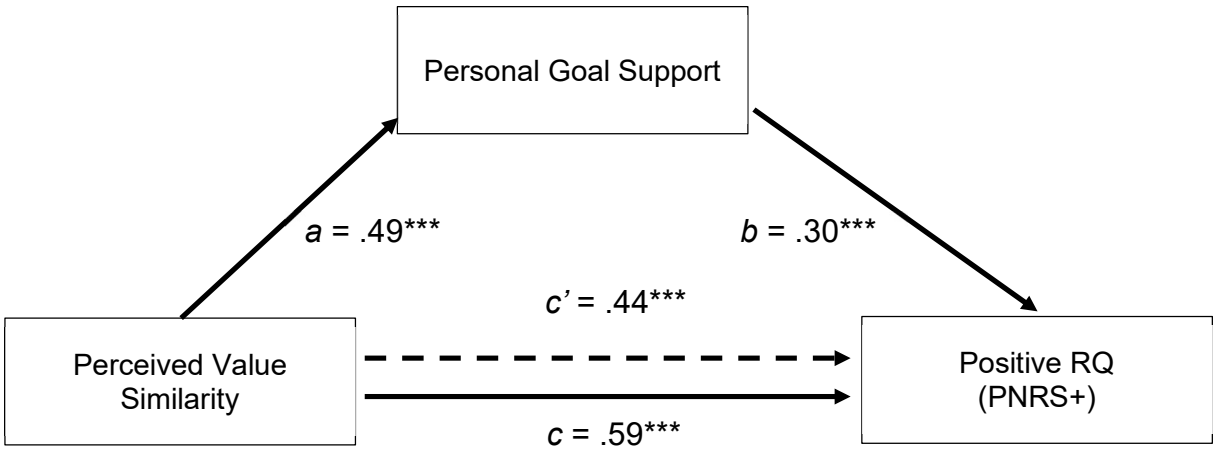
Cross-lagged model results for all perceived similarity dimension in their relations to IOS

	T1-T2 (*N* = 209)				T2-T3 (*N* = 189)				T1-T3 (*N* = 175)			
	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*	$\beta_{\uparrow}$	*p*	$\beta_{\downarrow}$	*p*
Values	-.00 [-.12; .11]	.980	.04 [-.08; .17]	.505	.07 [-.06; .20]	.306	-.00 [-.14; .13]	.950	.02 [-.11; .16]	.693	-.10 [-.23; .04]	.181
Ideals	.04 [-.08; .15]	.533	-.06 [-.18; .06]	.329	-.08 [-.21; .05]	.213	.07 [-.07; .21]	.363	-.06 [.02; .27]	.322	-.01 [-.15; .13]	.883
Traits	.03 [-.08; .15]	.550	-.00 [-.12; .11]	.993	.09 [-.04; .22]	.161	.08 [-.05; .21]	.215	.09 [-.04; .22]	.172	-.08 [-.20; .05]	.241

Note. The $\beta_{\uparrow}$ column shows coefficients for earlier perceived similarity predicting changes in relationship quality, while the $\beta_{\downarrow}$ column shows coefficients for earlier relationship quality predicting changes in perceived similarity. Values in brackets represent the 95% confidence interval.

Figure III-A

Study 3 Simple mediation model of the variables in the personal context. (N = 223)

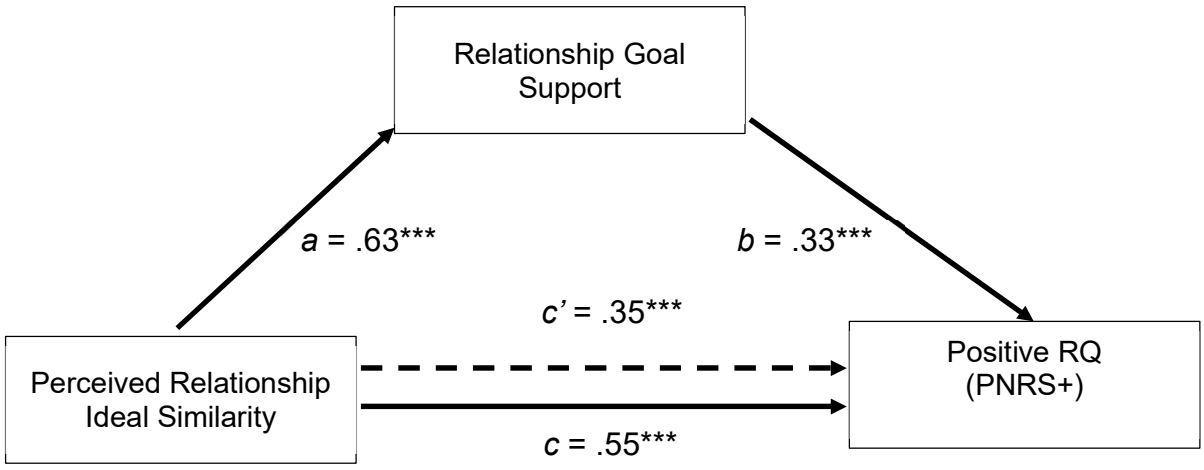


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-B

Simple mediation model of the variables in the personal context. (N = 227)

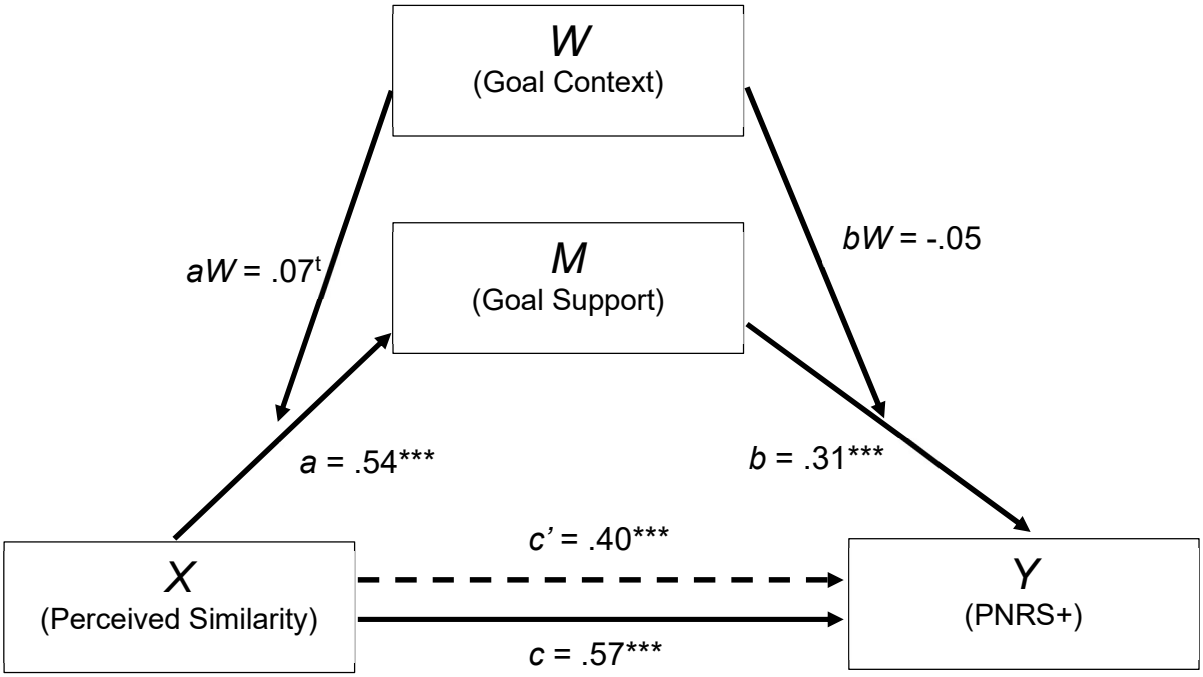


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-C

The complete hypothesised moderated mediation model for value and relationship ideal similarity. (N = 450)



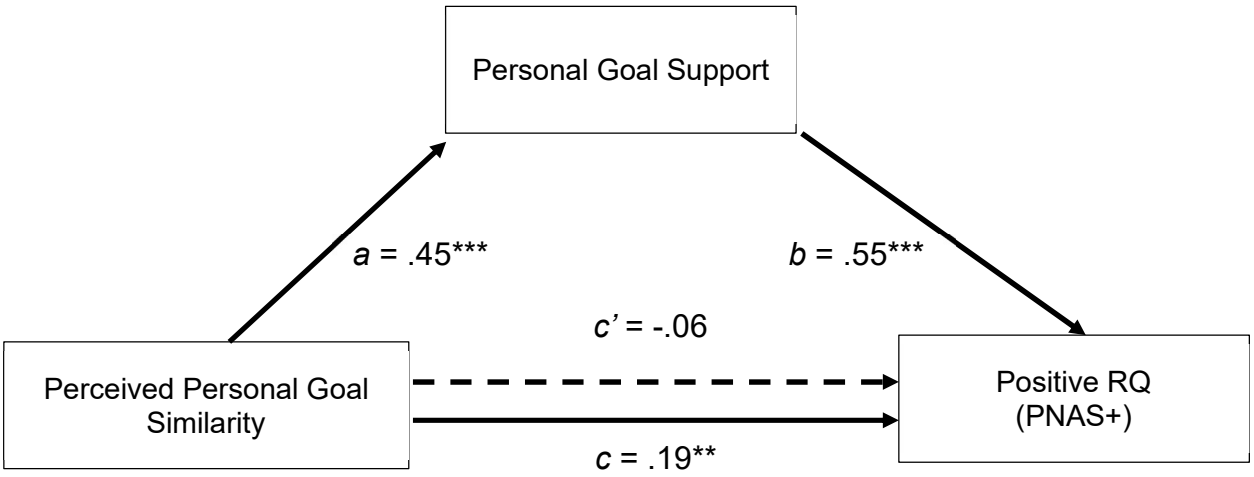
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = .02, p = .353, 90% CI = [-.06, .09]

Figure III-D

Simple mediation model of the variables in the personal context. (N = 223)

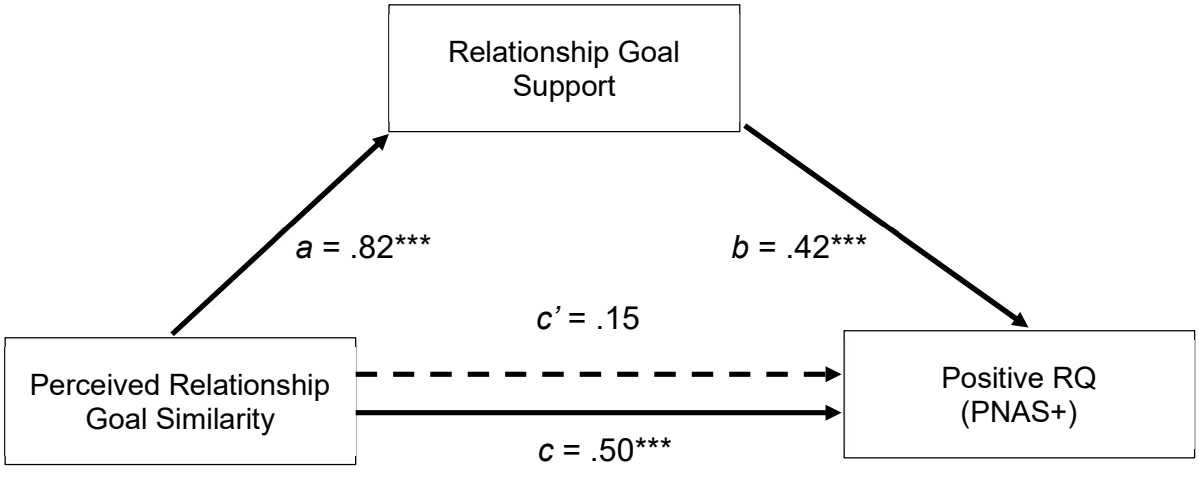


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-E

Simple mediation model of the variables in the personal context. (N = 227)

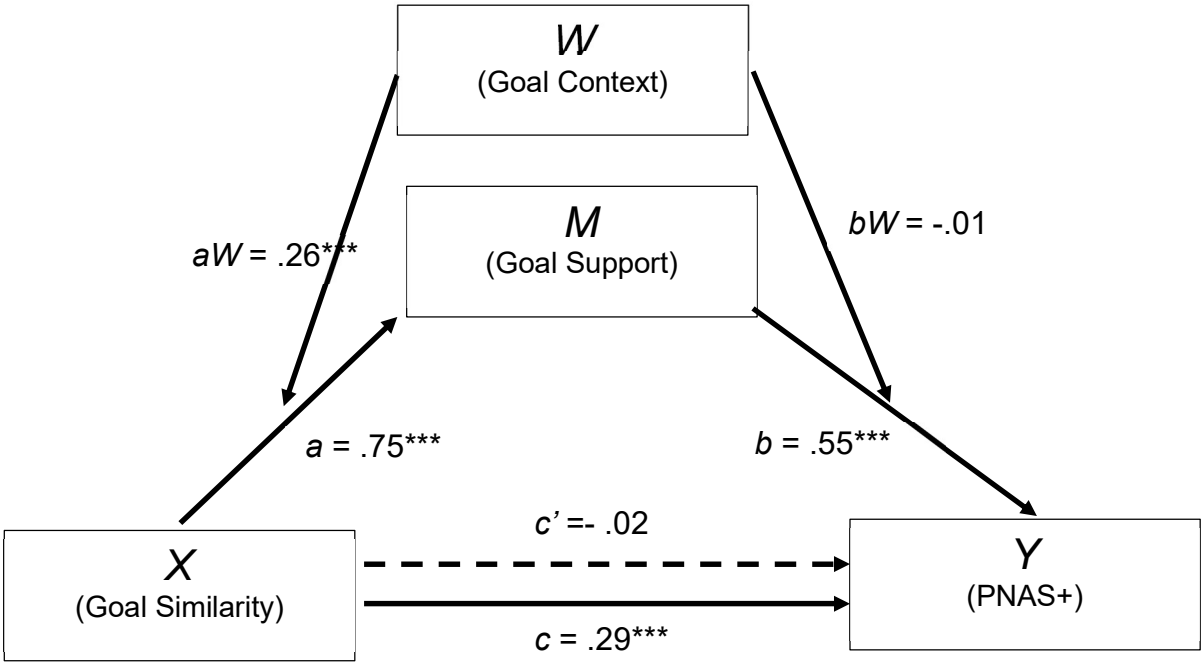


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-F

The complete hypothesised moderated mediation model for goal similarity. (N = 450)



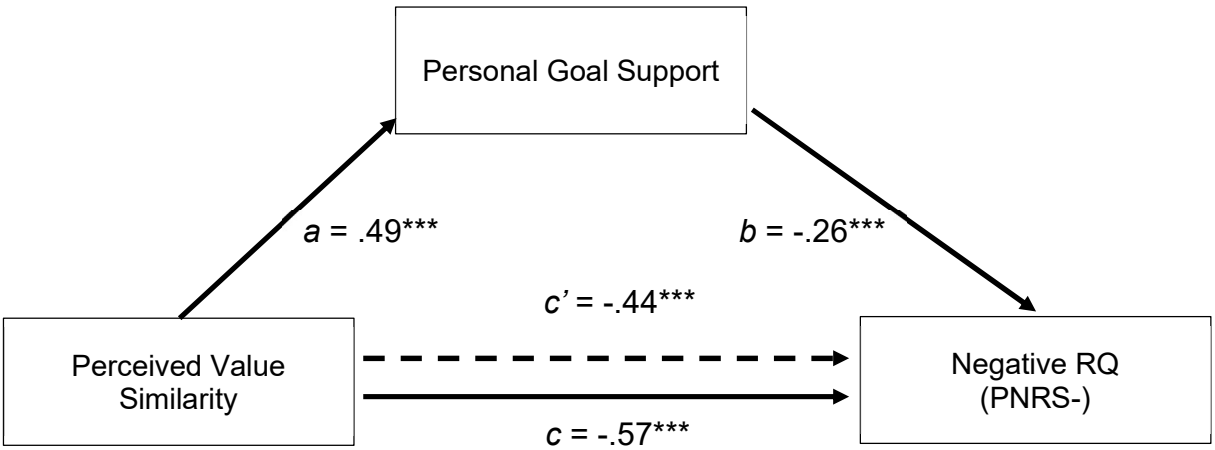
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = -.12, p = .140, 90% CI = [-.30, .06]

Figure III-G

Simple mediation model of the variables in the personal context. (N = 223)

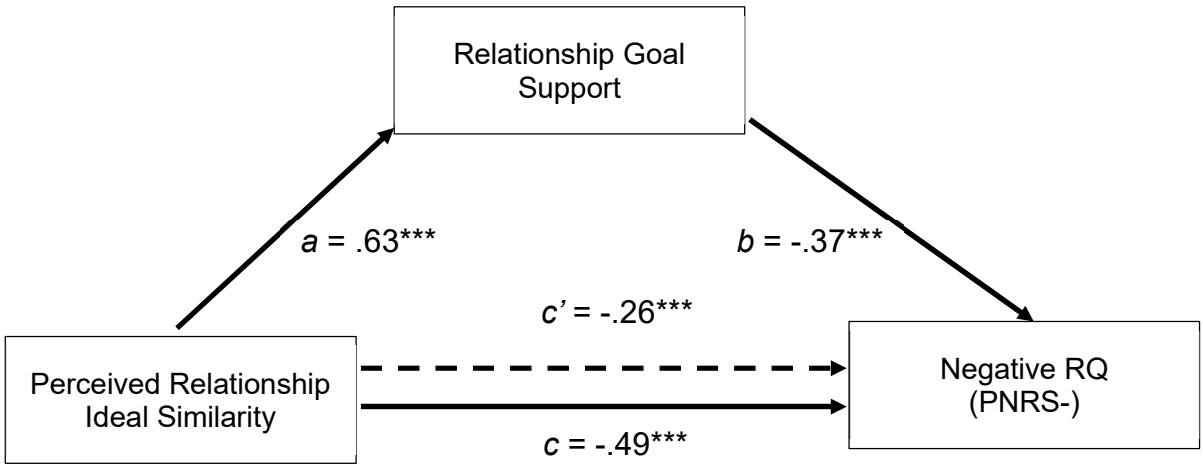


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-H

Simple mediation model of the variables in the personal context. (N = 227)

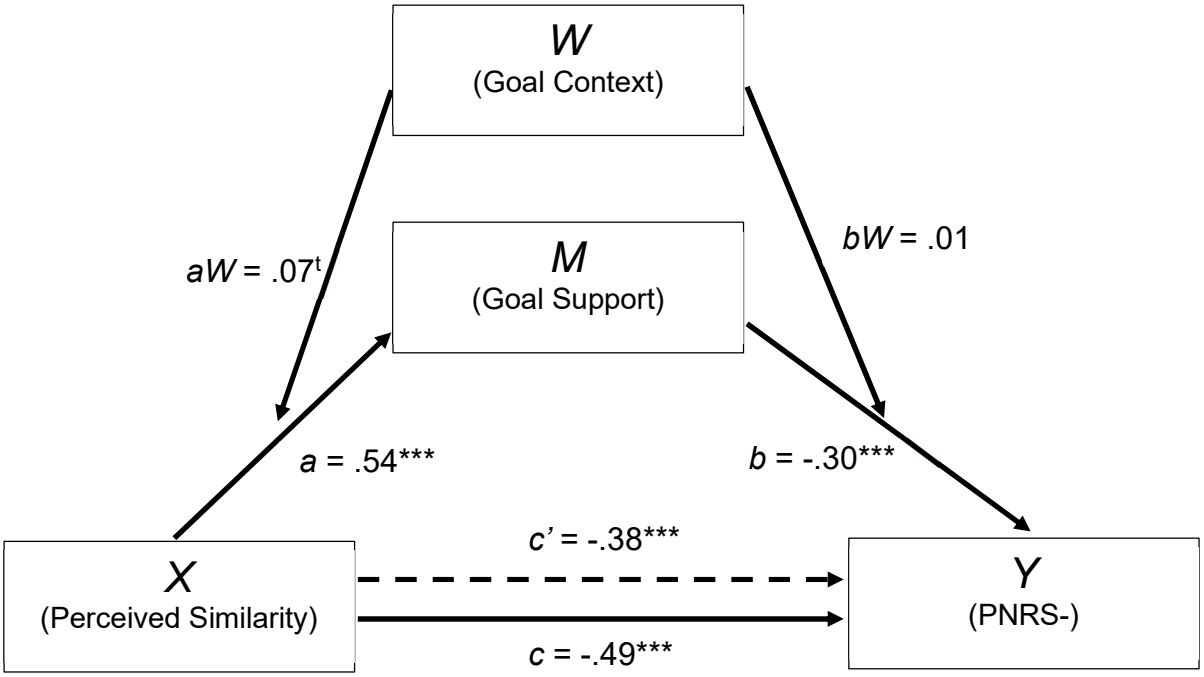


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-I

The complete hypothesised moderated mediation model for value and relationship ideal similarity. (N = 450)



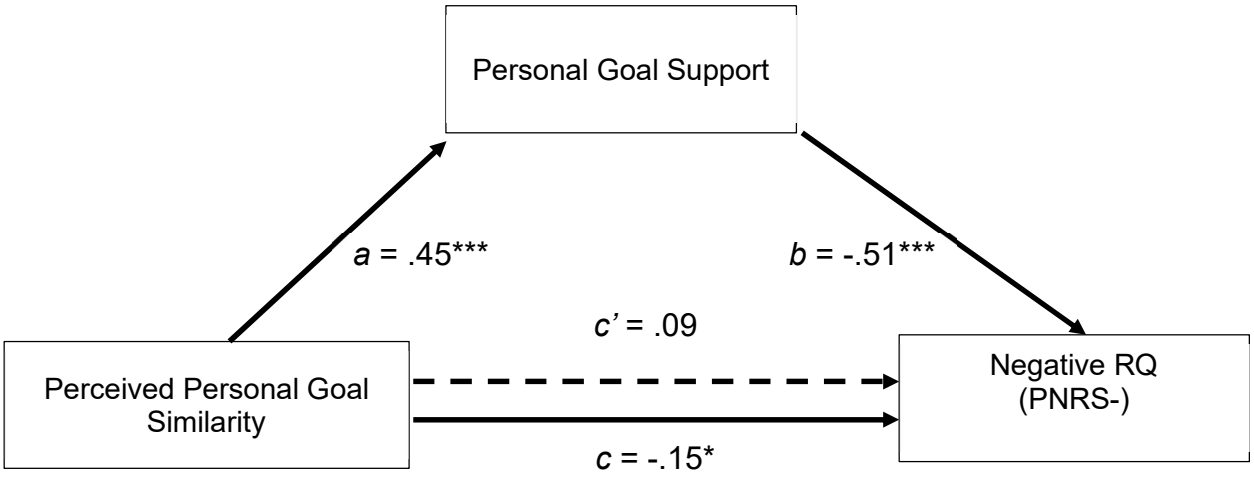
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = .01, p = .419, 90% CI = [-.06, .08]

Figure III-J

Simple mediation model of the variables in the personal context. (N = 223)

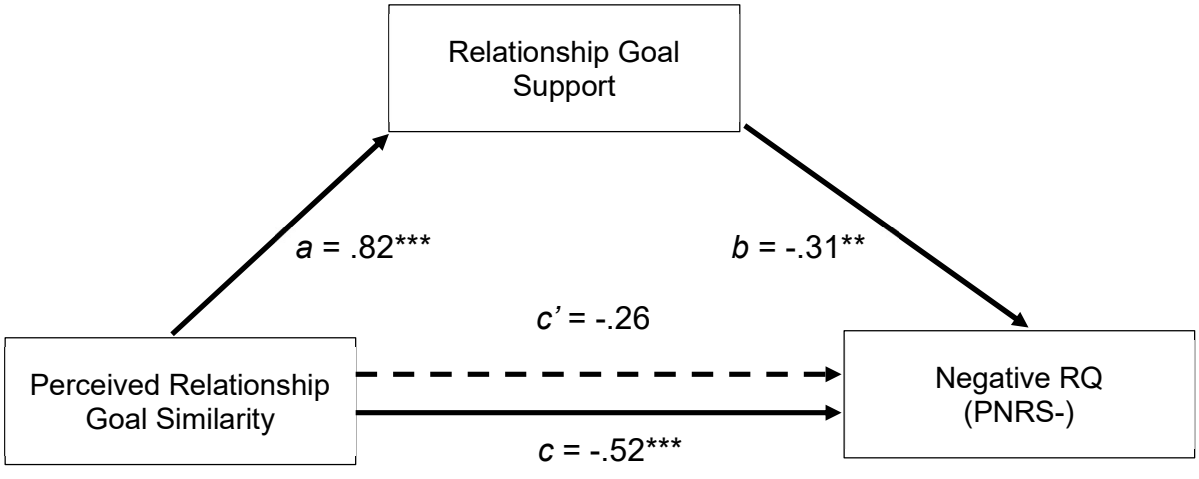


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-L

Simple mediation model of the variables in the personal context. (N = 227)

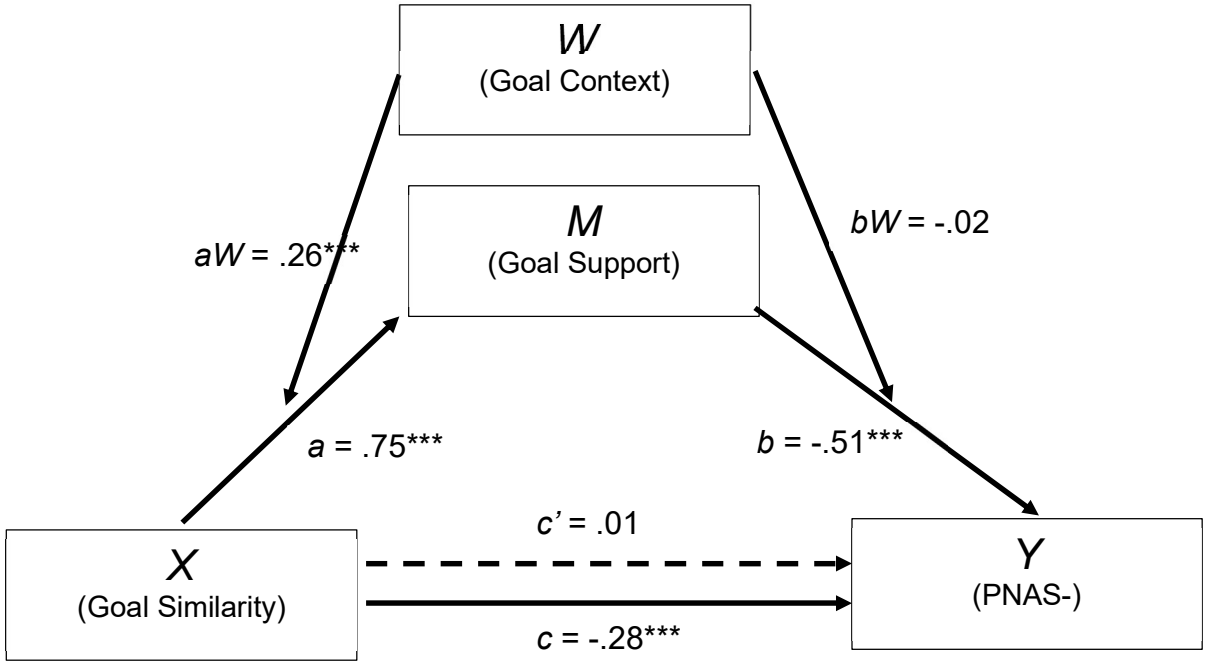


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-M

The complete hypothesised moderated mediation model for goal similarity. (N = 450)



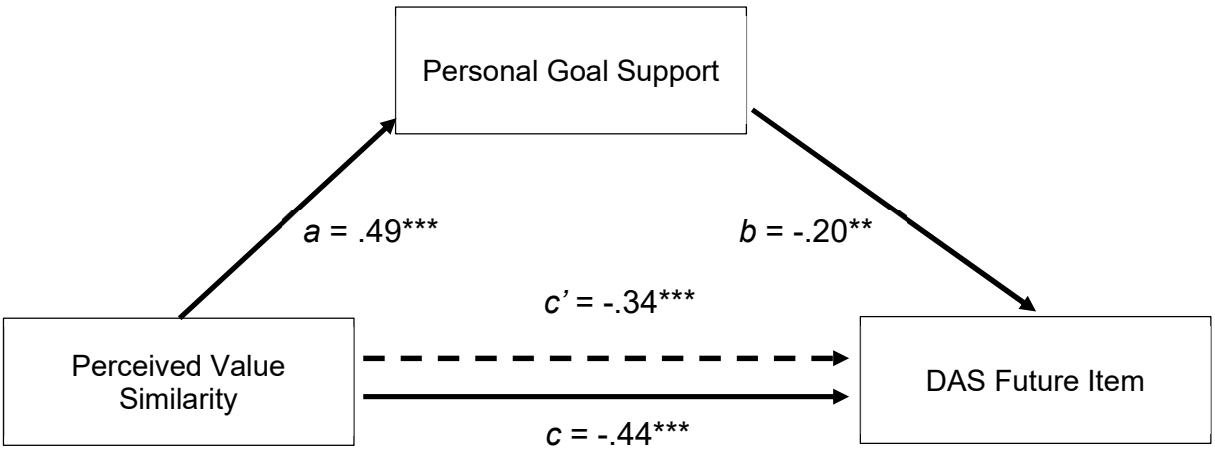
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = .16, p = .048, 90% CI = [.00, .32]

Figure III-N

Simple mediation model of the variables in the personal context. (N = 223)

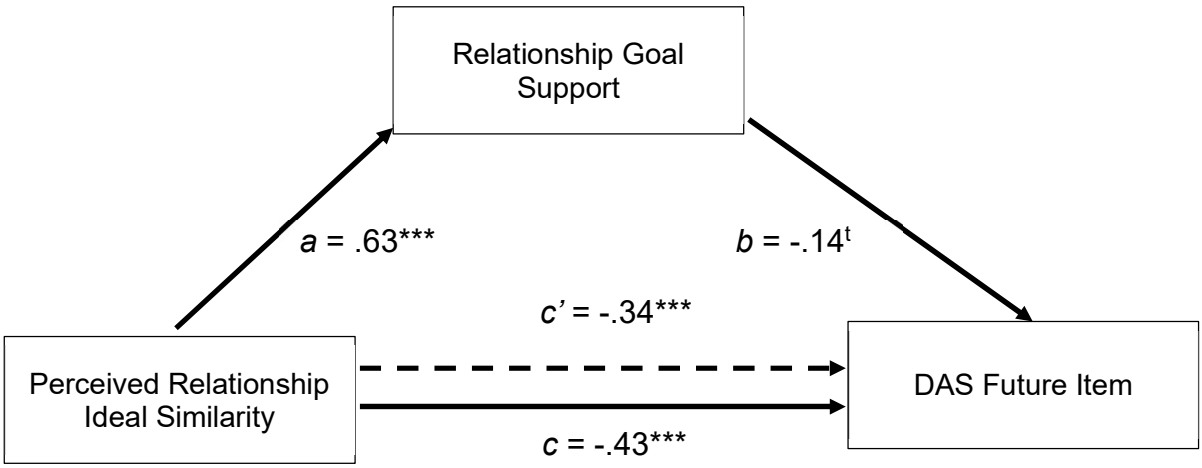


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-O

Simple mediation model of the variables in the personal context. (N = 227)

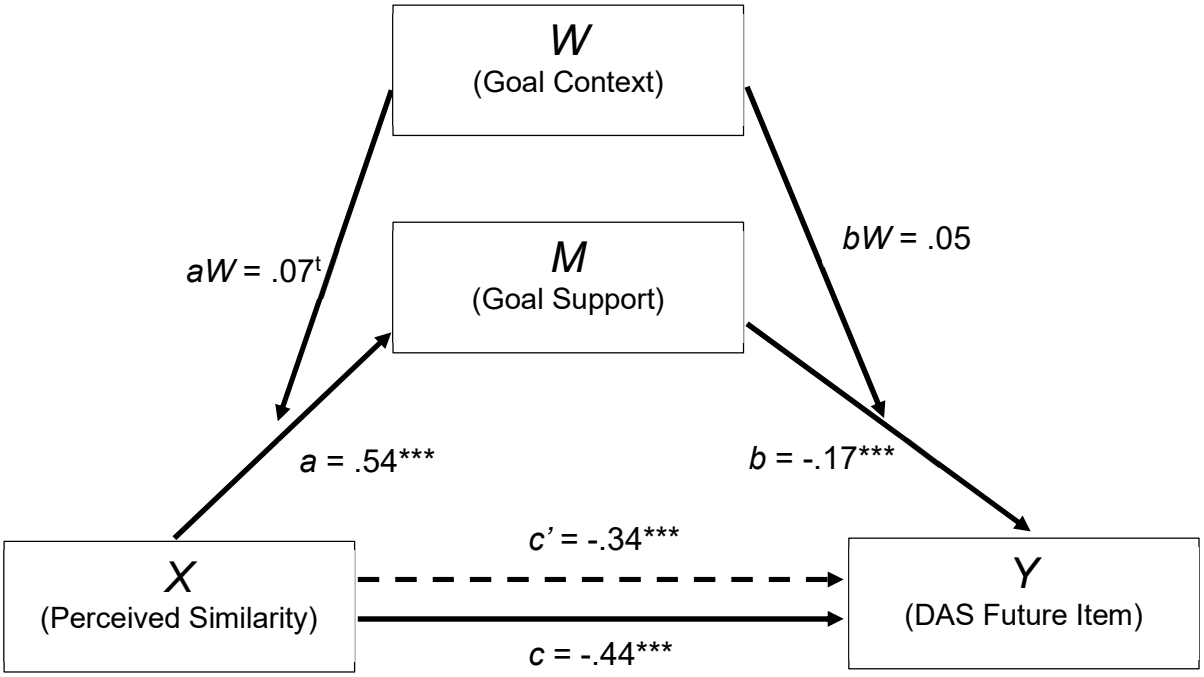


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-P

The complete hypothesised moderated mediation model for value and relationship ideal similarity. (N = 450)



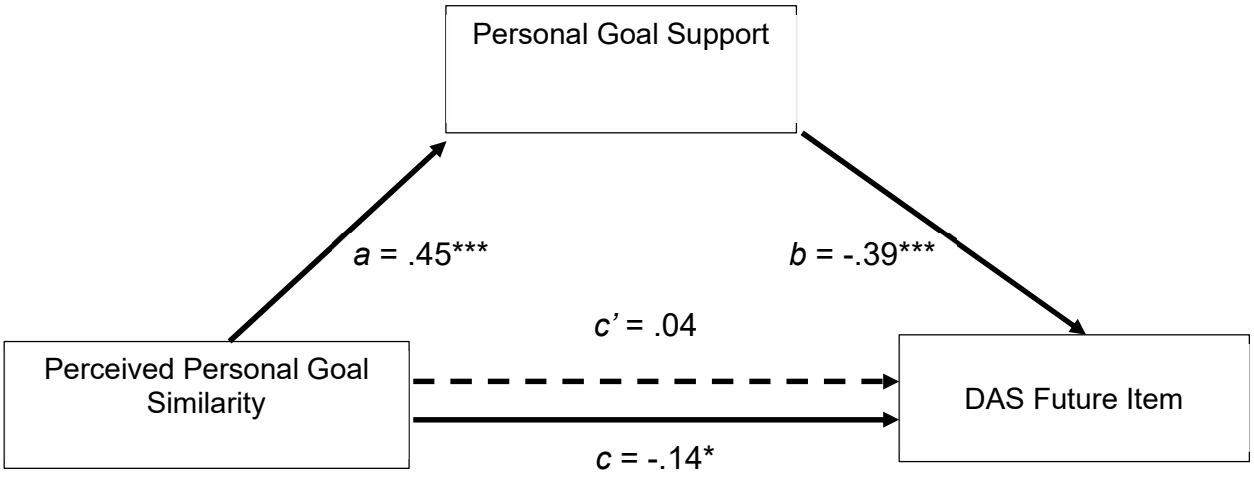
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = -.02, p = .283, 90% CI = [-.10, .04]

Figure III-Q

Simple mediation model of the variables in the personal context. (N = 223)

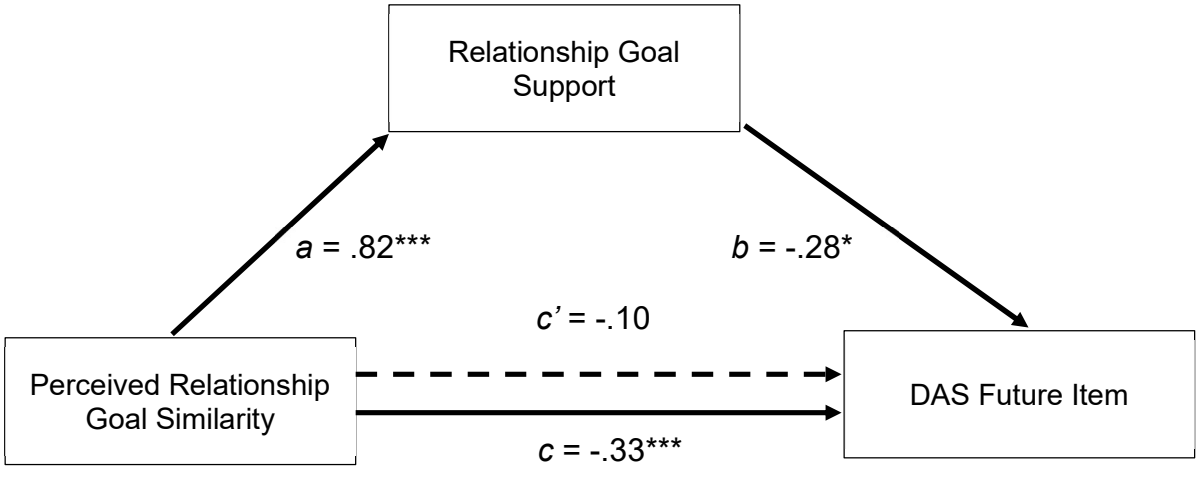


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-R

Simple mediation model of the variables in the personal context. (N = 227)

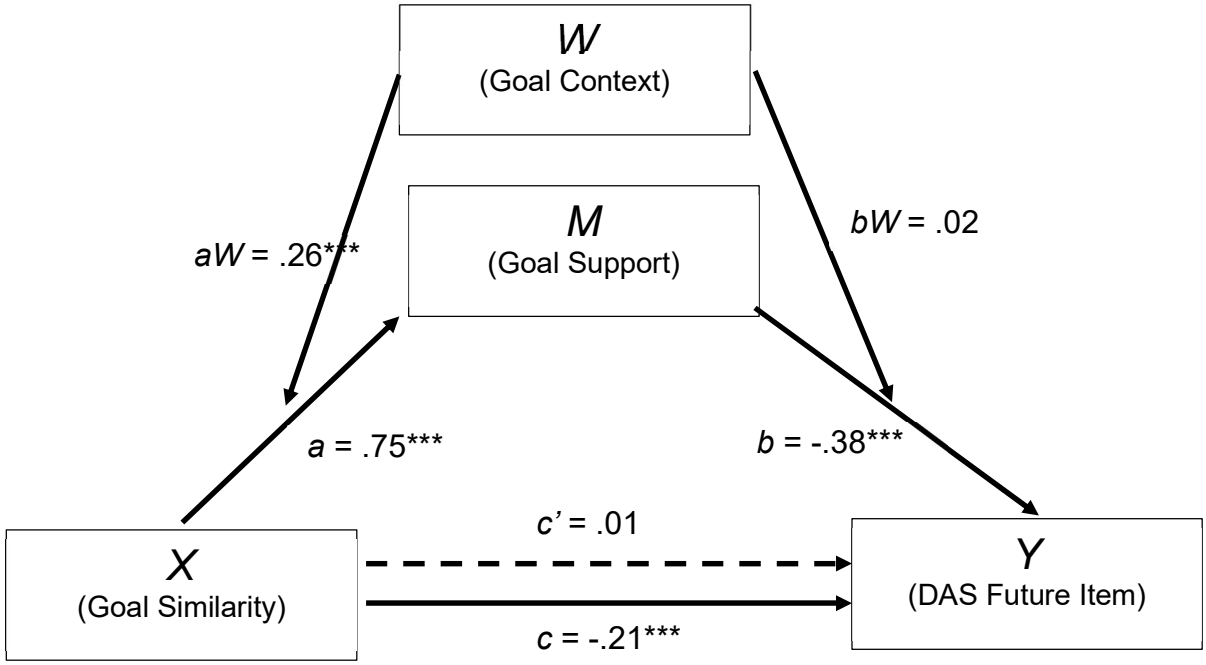


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-S

The complete hypothesised moderated mediation model for goal similarity. (N = 450)



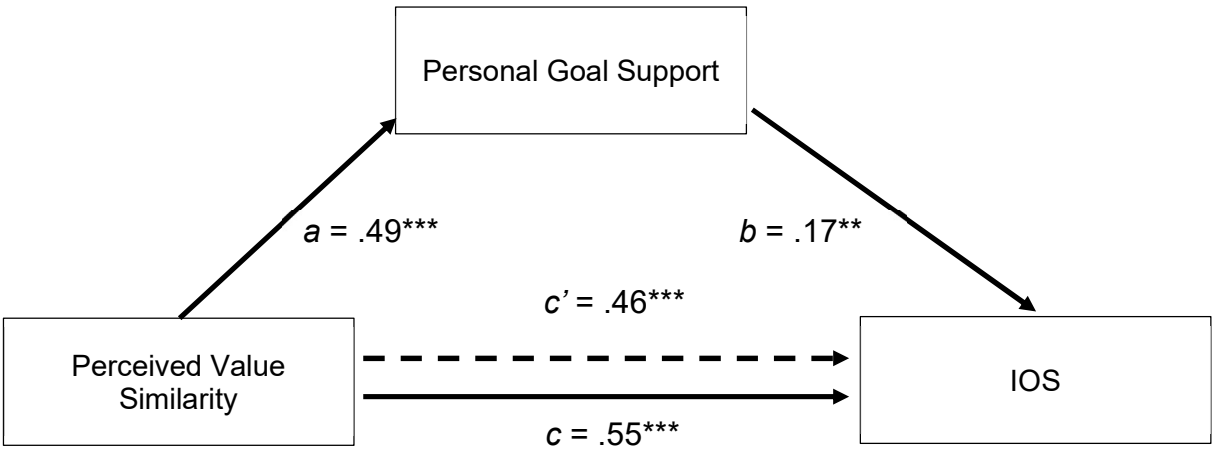
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = .06, p = .278, 90% CI = [-.11, .23]

Figure III-T

Simple mediation model of the variables in the personal context. (N = 223)

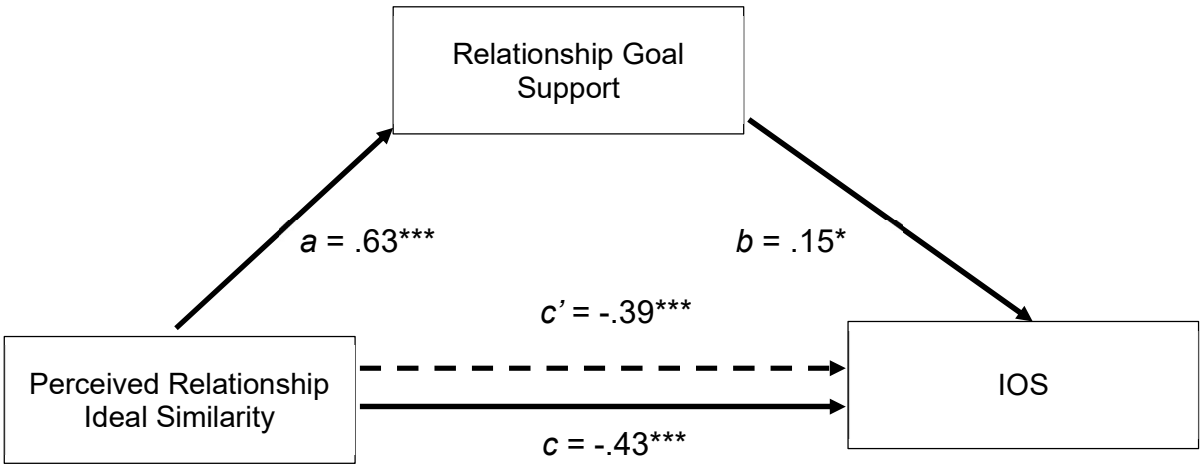


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-U

Simple mediation model of the variables in the personal context. (N = 227)

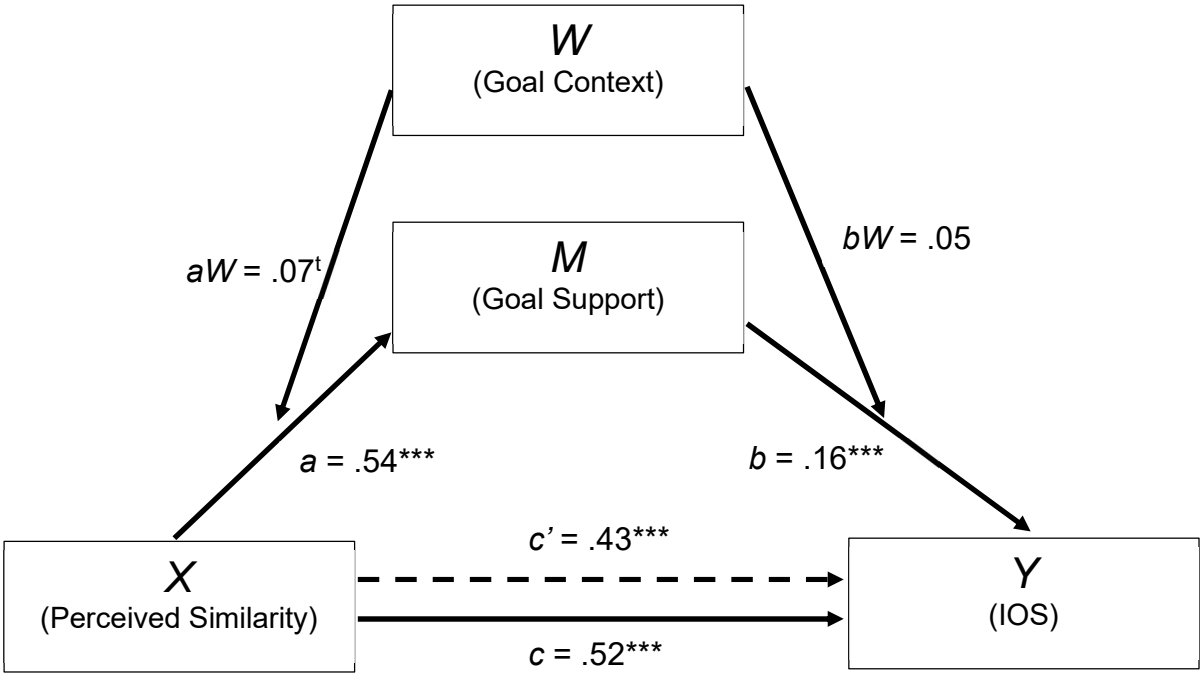


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-V

The complete hypothesised moderated mediation model for value and relationship ideal similarity. (N = 450)



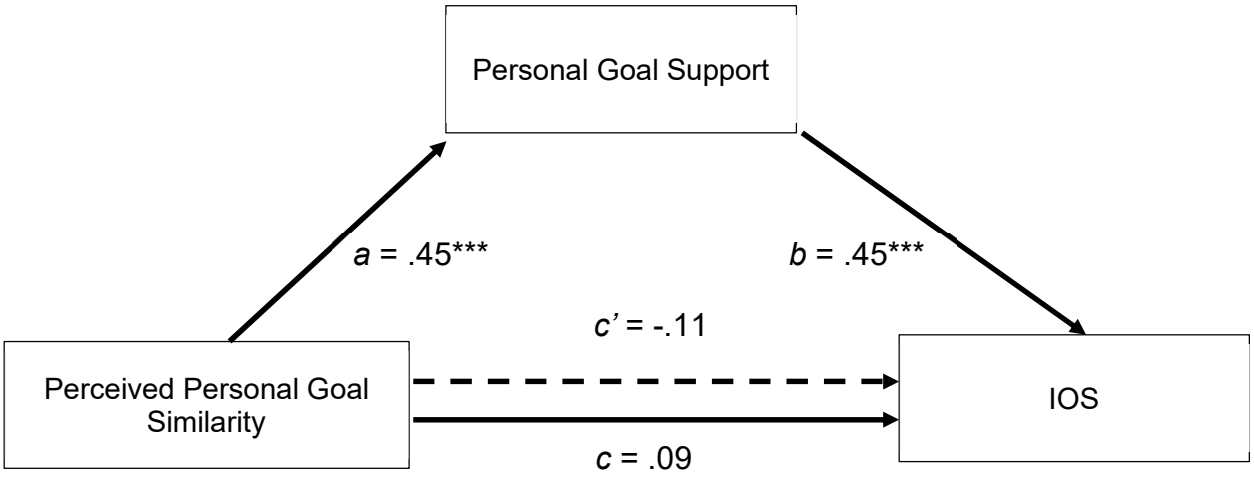
Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = .02, p = .263, 90% CI = [-.03, .08]

Figure III-W

Simple mediation model of the variables in the personal context. (N = 223)

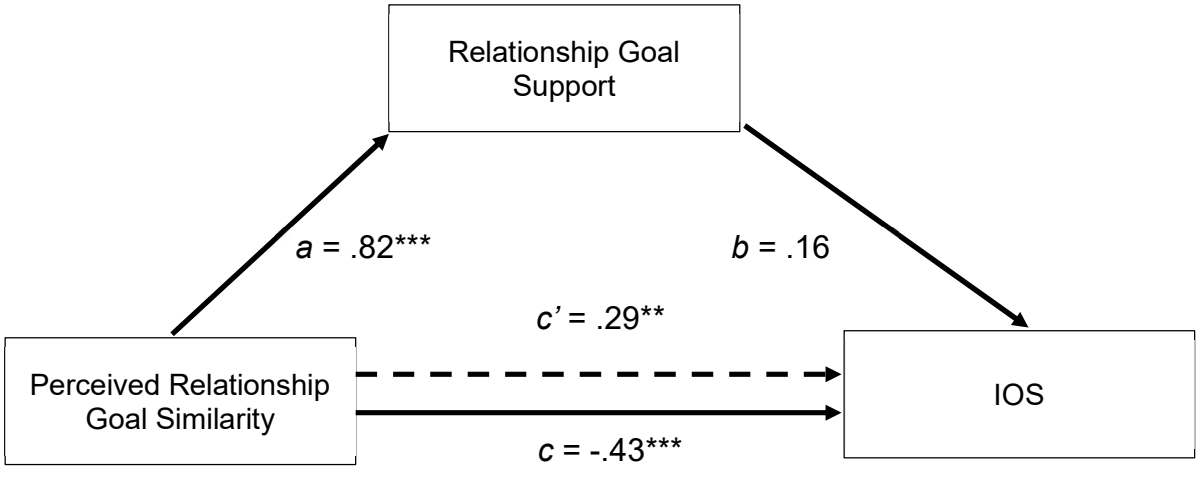


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-X

Simple mediation model of the variables in the personal context. (N = 227)

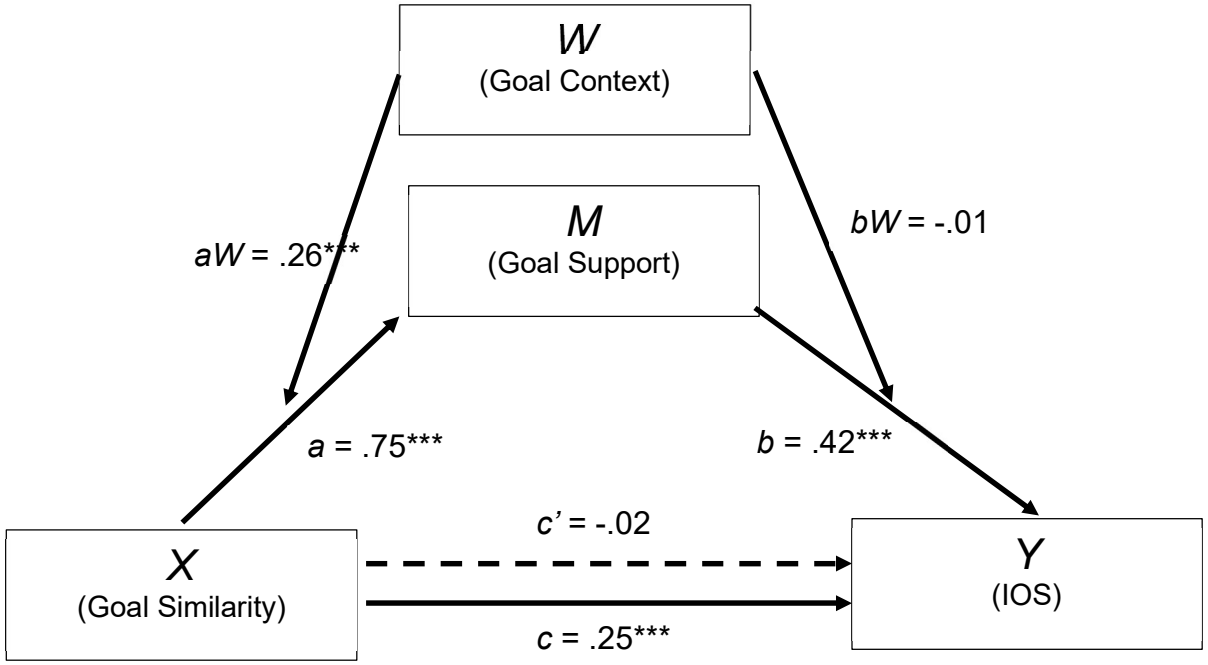


Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Figure III-Y

The complete hypothesised moderated mediation model for goal similarity. (N = 450)



Note. All values are standardised β coefficients.

***p < .001, **p < .01, *p < .05, ^{t}p < .1

Moderated Mediation: β_{abW} = -.10, p = .121, 90% CI = [-.24, .04]